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ABSTRACT

For thirteen months from June 1971 the Office for Scientific and Technical Information supported members of the Library Research Unit, University of Lancaster, in an investigation of the feasibility of designing computer-aided games to assist in teaching the principles and techniques of management to students of librarianship and information science. This volume is a report of the feasibility study, which resulted in the development, to prototype stage, of one such management game; it is expected that further work will result in "production models" of this and other games, for use in actual teaching situations. (Author/SJ)

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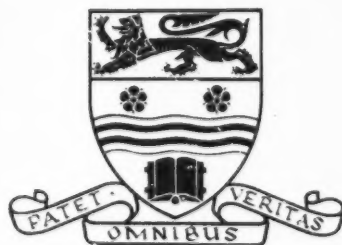
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A LIBRARY MANAGEMENT GAME

A Report on a Research Project

by

P. Brophy, M. K. Buckland, G. Ford,
A. Hindle and A. G. Mackenzie;
with an appendix by L. C. Guy



University of Lancaster Library

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PREFACE

This report is the seventh in a series of papers which are published, at irregular intervals, to make available the results of research work carried out by members of the Library staff (see inside back cover for previous titles).

For thirteen months from June 1971 the Office for Scientific and Technical Information supported members of the Library Research Unit in an investigation of the feasibility of designing computer-aided games to assist in teaching the principles and techniques of management to students of librarianship and information science. The present paper is a report of this feasibility study, which resulted in the development, to prototype stage, of one such management game; it is our expectation that further work will result in "production models" of this and other games, for use in actual teaching situations.

Sadly, this paper must also record the departure of a key member of the Research Unit: Dr. M.K. Buckland, who has played a major part in every project undertaken since 1967, and has indeed initiated a number of them, has now taken up a senior post in Purdue University Library. His replacement as Assistant Director of the Unit, from 1st April 1972, is Mr. M.G. Ford.

July 1972

A. G. Mackenzie
University Librarian
and
Director, Library Research Unit

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I. INTRODUCTION. THE USE OF GAMES IN EDUCATION

(a) Games as Educational Tools

Although the use of games in professional education has become widespread only during the last decade, the method has been used in a number of fields for many hundreds of years. Its origins have been traced to simple war games, used in military training when the "real thing" was either unavailable or too dangerous. In more recent times, these games have become more and more sophisticated, and many now use large electronic computers to handle the complex calculations involved. Since 1956, when the first well-developed management game was introduced (33), the technique has spread rapidly into a wide variety of disciplines (17,22,23,25,36,40,45) and today it is used at all levels of education, from primary school classes to courses for experienced professional men and women. One of the main causes of this "game explosion" has been the rapid development of sophisticated management techniques, such as simulation and mathematical modelling, which have been made possible by rapid advances in computer technology.

The principal use of games in education is not as a substitute for the more traditional teaching methods, such as lectures and seminars, but as a complement to them. A well-designed game is capable of giving the student some understanding of the complex interactions involved in any real system, without defining these interactions explicitly; this is important because many students experience difficulty in understanding the complex mathematics required to describe a real system. Furthermore students cannot be expected to attain an overall grasp of the behaviour of a system merely by attending lectures in which basic principles are taught, unless a way is found to bring these principles together into a coherent, well-balanced and recognisable form; here again the educational game can help by providing an over-view of the system. The use of games in teaching students who have no natural inclination to investigate the interactions on which they are based has been emphasised by Bruner (4):

"It can be demonstrated that fifth-grade children can play mathematical games with rules modelled on highly advanced mathematics; indeed they can arrive at these rules inductively and learn how to work with them. They will flounder, however, if one attempts to force upon them a mathematical description of what they have been doing, though they are perfectly capable of guiding their behaviour by these rules."

There are even more advantages to be gained from the use of games as teaching aids. Almost invariably the student is better motivated to learn and takes more interest in his subject (1,10), gains an overall "feel" for the real situation which is comparable to that gained by experience (2), will often undergo a change in attitude towards his course, and an increase in confidence in his own ability as a decision-maker (2).

Although some criticism has been levelled at educational gaming on the grounds that it may not be as effective, nor as widely applicable, as has been claimed, the weight of evidence suggests that when games are used in a well-designed environment they are an exceedingly effective teaching aid. Kraft(26), among others, has suggested that "few if any students will acquire a deeper understanding of social processes by playing games" although he goes on to say that "one can hardly object to games and simulation methods in certain fields - military tactics, mathematics, business management". There have been few thorough investigations of the effectiveness of games as educational tools, but those which are available have produced similar results. Raia(32) summarised his findings in the following way:

- i) "Game playing heightens interest and motivation."
- ii) "When used as a supplementary teaching aid, games enhance learning and heighten student interest and motivation..... In terms of learning game participants scored significantly higher on all parts of the final written examination than those who did not play."
- iii) "Participation (in the games) did not adversely affect the students' ability to analyse business cases"
- iv) No significant differences in attitude (to the course) were found although students stated that they preferred the game as an instructional aid.
- v) The benefits derived from a game are not directly related to its complexity - "added complexity is probably not profitable beyond a certain point."

(b) Types of educational game

We have made no attempt to define rigorously our concept of an "educational game" since the boundaries separating games, simulations, practical classes, seminars and even lectures are fluid. Furthermore, much of the terminology used in this field is ambiguous or misleading - "game theory", for example, has little relevance to educational gaming, and the verb "simulate" can have a number of meanings - from "to have or assume a false appearance"(12) to a word which "delineates a range of dynamic representations"(39). In this report we incline to the latter definition. However, in order to clarify the terms which are commonly met in the field, we describe below the various types of game and related techniques which are in common use today.

i) Case Studies These exercises are not strictly simulations (i.e. they are not dynamic representations), but descriptive studies of the state of a system at one or more points in the past. The student is required to analyse and discuss the system as it is presented to him, but there is no possibility of the system being modified as a result of the student's

actions. Case studies have been used widely in education for librarianship(20,21,28,35) (there are indeed few library schools which do not make some use of them) and have made a valuable contribution to the understanding of the real library system.

The basic limitation of case studies is that they cannot simulate the passage of time - "No matter how realistic the symbolism might be surrounding decisions issues in a case, once decisions have been made and discussed the case model has served its usefulness."(15) Despite this limitation the case study forms a preliminary step in the design of most models.

ii) "In-tray" Exercises. In these exercises, which are an extension of the case study, the individual student is called upon to play a specific rôle and must, in isolation, deal with the problems and take the decisions which that rôle demands. His responses are sometimes marked in order to assess his performance, and a time-limit can be set in order to increase the pressure upon him.

In library schools, the rôle played by the student is often that of the librarian, and the student might be required to deal with each item in the morning post(18). The Manchester Public Libraries Library Management Game on the other hand, involves the simulation of the steps in the career of a librarian, and requires a number of students to work more or less independently within a group(11). A computerised version of an in-tray exercise has recently been developed at one American library school(44).

iii) The "Incident" Process. This type of exercise is a further development of the case study: it restricts the amount of information given to the student at the beginning of the exercise, forcing him to assess his information requirements. He must then demand the information he needs before taking a decision. These exercises therefore introduce to the student the need to demand information on which to base decisions, and force him to realise the difficulty of determining exactly the information which is required(31).

iv) Rôle-Playing. Essentially this type of exercise requires a group of students to take part, interactively, in a "life-like" situation and to discuss their actions and the development of the situation among themselves. The technique is used particularly as a method of gaining insight into problems of personnel management and human relations. In librarianship, rôle-playing exercises have been used to teach interviewing techniques(18).

v) Simulation-Gaming. The participants in these exercises take decision-making rôles in hypothetical environments. They make decisions on the basis of the information supplied to them, note the effects of these decisions on the system, as represented by the model, and adjust their behaviour accordingly. The models must therefore be dynamic and for this reason they are usually computer-based, although in the simplest simulation-games the computer may be human. Although widespread

in many fields, and particularly in management(13), as far as we know there have been no simulation-games in librarianship or information science management.

In essence, the main characteristics of a simulation-game are as follows:-

- (a) The simulation of the environment is created in such a way as to allow feedback of the results (e.g. values of the measures of performance) to the student.
- (b) The characteristics of this environment must be expressed, at least implicitly, as logical or mathematical relations. For example, the rules of most games are a logical expression of certain restrictions on the players.
- (c) The presence of logical and mathematical relations necessitates the use of a computer. The rôle of the computer (which may be human, mechanical or electrical) is to use the defined mathematical and logical relations in order to determine the simulation's response to the student's actions.
- (d) Every simulation-game is a simplification - sometimes a very drastic simplification - of the real system which it represents.

Case studies, in-tray exercises and rôle-playing have been used extensively in library schools both in this country(18) and abroad(37). These types of game are covered only briefly in this report - our main concern is with simulation-gaming in the field of library and information service management. Thus one of our main aims has been to assess the value of dynamic educational models in teaching management to students of library and information science.

II. THE FEASIBILITY STUDY - AN OVERVIEW

(a) Aims and Objectives

In the light of our experience with operational models in library management we considered that it would be well worth investigating the feasibility of developing such models as educational games, to be used in teaching students (of whatever age or seniority) how to improve their grasp of the principles of library and information service management. The feasibility study was therefore designed to include the following activities:

- i. Wide-ranging consultation with potential users of this type of game, particularly the library schools in Britain and abroad, and with other interested bodies. The aim of this consultation was to be two-fold - to inform potential users of the work which we proposed to do, and to inform ourselves of the users' needs and of the facilities available to them.
- ii. Investigations of the "state-of-the-art" of education for library management, in order to determine the present content of syllabuses, and whether advanced management techniques are covered. These investigations were also to cover the place of gaming in the syllabuses, the methods used at present, and the general time-constraints.
- iii. A detailed design study for a library management game, including the identification of a suitable model for development and a study of the problems likely to be met in converting it into a game.
- iv. Consideration of the managerial problems of all types of information service, and particularly those with which we are not ourselves familiar (such as industrial information units). The aim of this part of the study was to be the examination of the potential scope of educational gaming in librarianship and information science.
- v. The design of a methodology for the evaluation and testing of a library management game, in order to determine whether such a game would be (a) valuable in educational terms, and (b) adopted by the schools (or other bodies).
- vi. The determination of methods for comparative costings of various modes of the proposed game:
 - (a) Interactive with the computer.
 - (b) Mixed manual/computer-aided.
 - (c) Entirely manual.

At the beginning of the feasibility study we decided that the most convincing proof of the feasibility of gaming in librarianship and information science would be provided if we could design, develop and demonstrate a prototype game. Objective iii. (above) was amended accordingly.

SPRING 1971	JUNE 1971	MARCH 1972	JUNE 1972
Design of project schedule. Appoint consultants/staff			
Consider models for development			
Liaison with potential users Investigation of 'state-of-the-art'			
Library management game - design and development			
Design of demonstration course			
Publication and presentation of relevant papers			
Trial run of the course			
Demonstration course			
Final development of methodologies for costing & evaluation			
SPRING 1971	JUNE 1971	MARCH 1972	JUNE 1972

FIG. 1. THE SCHEDULE OF THE FEASIBILITY STUDY

(Note that the scale is not linear)

(b) The Schedule of the Feasibility Study

Although the study has lasted for only one year, it has included a number of discrete phases, some of which overlapped to a considerable degree. Some phases were planned in detail at the beginning of the project, others developed as the need for them became apparent. Fig.1 outlines the progress of the study throughout the year. Of course, this diagram does not represent the different emphases which were placed on different aspects of the project at different times. For instance, it was necessary initially to spend time familiarising ourselves with past research on educational games, and some members of the project team had also to familiarise themselves with our previous research. Towards the end of the project, a number of minor aspects of the subject had to be studied in order to produce a complete report.

III. THE BASIC MODEL

(a) Choice of a Model for Development

Once we had decided to develop a demonstration or prototype game, it was necessary to examine the models upon which such a game might be based. After careful consideration, three models were suggested and the merits of each were discussed.

i. Book Processing

An early decision in library planning is the assessment of the budget and the primary division between book purchasing and labour. Most of the labour is concerned with the processing of books, which consists of a sequence of simple procedures: selection; ordering; receipt; cataloguing; labelling and shelving. Each of these procedures can be regarded as a simple queuing problem, depending on the amount of labour assigned and the inflow from the previous procedure. This area has already been modelled at Lancaster, and a simulation was run on a computer in 1967 (5).

The decisions to be made are:

- the size of the book budget
- the size of the book processing budget
- detailed deployment and re-deployment of labour between individual procedures.

The output is the addition of books to the library, which may vary with respect to:

- the number of books processed
- the mean processing delay
- the unit processing cost.

ii. Stock Models

A more basic problem is that of collection building: how many titles should the library possess, and, for how long a period should they be retained? These questions have been investigated for collections of journals, in some detail during previous research at Lancaster (6), and at University College London (3). However, little work has been done on models of a monograph collection, although there is little reason to suppose that they cannot - in principle at least - be treated similarly. The output would be the proportion of demand satisfied by the stock policy chosen. The main disadvantage of this model for the purpose of the project is that not enough was known about its complexity, although subjectively we felt that it would be unmanageable in the time available.

iii. Loan and Duplication Models

Given a defined pattern of stock, the impact which differing levels of duplication and alternative loan policies will make on various measures of the library's performance can be assessed.

As a game this has significant advantages:

- it involves at least two different decision areas which have tended to be treated independently.
- the decisions have a strong interaction with each other and with the level of demand. For the participant the decisions are non-trivial.
- although the interactions require mathematical models of some sophistication the game is technically fairly straightforward.

At a project meeting in June 1971 it was decided that the most suitable segment of the library to develop a demonstration game would be the model of loan and duplication policies in an academic library. A further decision taken at this meeting was that a short course should be held in order to evaluate the game once it had been developed, and to demonstrate it to potential users.

(b) The Model of Loan and Duplication Policies

The model of loan and duplication policies is fully documented in the final report of a previous research project (5) and only a brief summary will be given here.

The borrowing process which is simulated by the model is shown in Fig.2. Each request is processed as it arrives at the loan desk, and will be satisfied or not according to the availability of the book. Should the book be available for borrowing, it will be issued for a definite loan period, and will be unavailable to other borrowers until it is returned. The technique used in the model is known as Monte Carlo simulation, and requires a number of probability distributions to be input. For instance, the length of time between successive demands for a book, and the probability of a reservation being made should the book be unavailable, must both be input in the form of a set of probabilities of specific actions occurring on specific occasions; these probabilities are derived from a real-life sampling exercise.

The important inputs, from the librarian's point of view, are the loan period and the duplication level. In other words, the librarian must define the length of time for which a book may be borrowed from the library, and also the number of copies of the title held by the library. These are the major variables which the librarian, in the real situation, can use to influence the availability of books in his library.

The output provided by the simulation includes:

- (i) The percentage of users who, at the first attempt, found the book for which they were looking.
- (ii) The percentage of users who eventually found the book which they wanted.

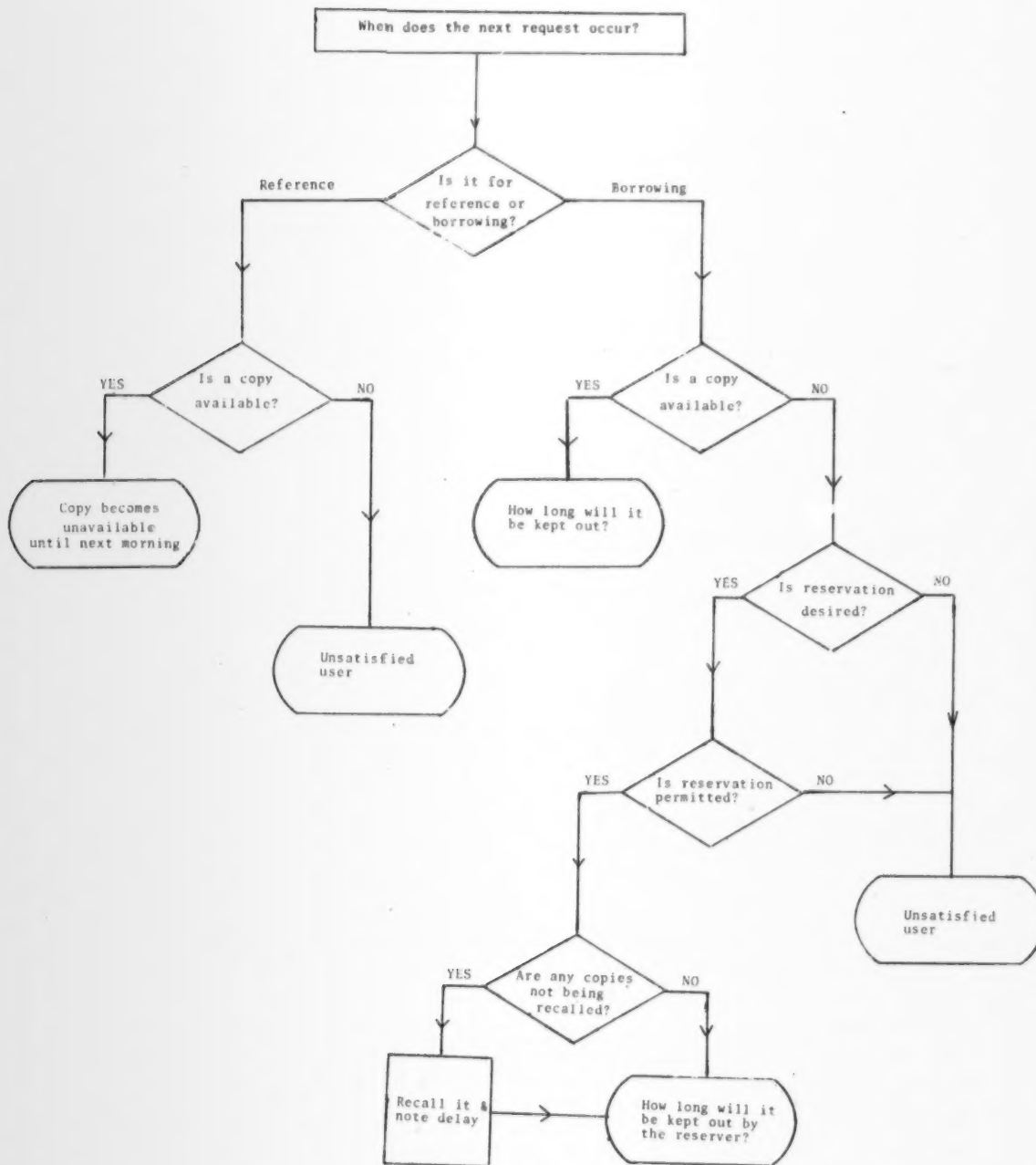


FIG. 2. THE LOAN AND DUPLICATION POLICY MODEL - DESCRIPTION OF THE BORROWING PROCESS

The main purpose of this simulation is to enable the librarian to determine the effect on availability (and hence on user satisfaction) of changing loan and duplication policies. It was used operationally to determine the effect of introducing a shortened loan period and a revised duplication policy at Lancaster in 1969(5).

(c) Development of the Model

(i) Objectives

Any operational simulation requires very considerable modification before it can be used as an educational game, largely because the objectives of the two types of simulation are so different. For example, the cost of running an operational simulation is not usually an overriding constraint, whereas the cost of running a gaming simulation, which might have to be used continuously and repeatedly, is often of great importance.

The loan and duplication model required modification in the following ways:

- (a) The operational simulation of loan and duplication policies consists of a Monte Carlo simulation, which takes each request separately and follows it through to its conclusion (either borrowing or reference, satisfied or dissatisfied, and so on) before returning to consider the next event. This is obviously a very time-consuming task, even for a modern electronic computer. A more efficient method was therefore highly desirable, even if it meant a slight loss in accuracy of the results.
- (b) In order to add realism to the game, the student should be allowed to "buy" new titles for his library, as well as to duplicate copies of existing titles; in other words, the cost of acquiring new material must be treated as a penalty or handicap on the player.
- (c) The simulation-game should be used as a "management aid" in the gaming situation and not as a game in its own right; in other words the game would form only one part, although admittedly a central part, of the course.
- (d) Additional, and meaningful, measures of the library's performance should be developed and incorporated into the game.
- (e) The simulation-game would have to be used via an on-line computer terminal (cf. section VI below) and it would therefore be necessary to program it accordingly.

(ii) Development

- (a) The results which had been produced by the real-life operational simulation were analysed and a mathematical equation was formulated which was capable of reproducing them with reasonable accuracy. Using this equation it was possible to reduce the size of the computer program, so that the complete Game program is only slightly longer than the program required for the original Monte Carlo simulation. The inevitable reduction in the accuracy of the results is difficult to assess exactly, but even in extreme cases should not cause a difference in the results of more than $\pm 3\%$.
- (b) In the simulated situation, one of the few constant factors is the distribution of demand. That is, it is assumed that the stock of the library can be divided into discrete "popularity classes". Popularity is defined in terms of the number of demands during the year, so that the lowest class includes all books for which no demands are received, and the highest class includes all books with more than four demands per year. The proportion of the book stock in each class is fixed. When new monograph titles are added, we stipulate that these must be distributed among the popularity classes so that the overall distribution of the library stock remains unchanged. This procedure, at first sight somewhat unrealistic, does accord with the conclusions, derived from studies at Lancaster and elsewhere, that a fairly high proportion of new titles is not used, and that very few are used a large number of times. This effect is heightened in the prototype game, in which it is assumed that books in the library do not become obsolete (this assumption will be changed in future versions).
- (c) The fact that students will be required to use the simulation as a management aid means that they do not necessarily need to be in direct contact with the computer. In order to structure the gaming situation in the most efficient way it was therefore decided that a game editor would be used to interpret players' decisions to the computer. The implication of this decision was that the input to the computer did not need to be very flexible, and could thus deliberately be designed in a highly structured form. This point is further explained in section IV(a) below.
- (d) The rôle of the library in the community has been the subject of much discussion in the past and continues to be so today. We felt that any game which was to teach the student the benefits of certain policies must allow some flexibility in the measures of performance used. The Game was therefore designed to provide the following information:
 - i. The total cost (of books and services) over the "year".

- ii. The total number of issues during the year.
- iii. The satisfaction level at the end of the year. This is defined as the percentage of the total demands on the library which are immediately satisfied. Or, alternatively, it can be defined as:

$$\% \text{ Satisfaction level} = \frac{(\text{no. of times item was available})}{(\text{no. of times item was sought})} \times 100$$

Satisfaction level is therefore a measure of user satisfaction and also of the availability of books.

- iv. The total amount of document exposure. Document exposure was suggested as a measure of library performance by Hamburg, Ramist and Bommer in 1971(19). It can be defined as the amount of actual usage ("eye-to-page" contact) which an individual book receives during the period that it is on loan to a single reader. If this "usage per issue" is totalled for all issues during the year, the total amount of document exposure is found, and can be used as a measure of performance.
- v. The collection bias. In the majority of libraries the most popular books are removed from the shelves by borrowers. When another borrower comes to the shelves he finds that the collection is "biased" towards the least-popular books. "Collection bias" is a measure of the extent of this bias, and is defined as that percentage of the 10% most popular books which is absent from the shelves at any one time. It is hence a measure of the suitability of the library for browsing.

The gaming situation is described in detail in section V which deals with the Short Course used to evaluate and demonstrate the game.

IV. THE STRUCTURE OF THE GAME

The following section covers those features of the game with which the game editor must be familiar, although the information is not needed by participants. The rôle of the game editor is to act as a "buffer" between the players and the computer, and as such he must be familiar with all the aspects and interactions of the game.

(a) Control

Any number of students may use the game at any one time, although there is a maximum of ten "libraries" - should there be more students than libraries the students should work in groups. In practice sessions with our own time-sharing terminal we found that there was an effective maximum of six libraries if undue delays were to be avoided. However, this constraint can be avoided by limiting the number of runs each library is allowed to make. Each student (or group of students) is in charge of his own independent library, which is totally unaffected by the policies pursued by other students. He can change the policies of his library each "year" for a specified number of years, and can return to the starting-point at any time. These policies must be input by the game editor each year even if they are not to be changed. In other words, the game requires that the policies of each library be defined each year.

Before the game is used, the game editor must define:

- (i) The number of libraries
- (ii) The maximum number of consecutive years for which a library may be run.

(b) Policies

The policy decisions which a student may take are strictly limited to the following:

- (i) The Loan Policies, defined in any way (e.g. by the popularity of a book, or by status of reader).
- (ii) The Duplication Policies, defined in any way.
- (iii) The number of new titles to be bought - the actual titles will be chosen by the simulation according to a fixed and fairly successful selection policy.

(c) Features of the Game

i) Costs

Unit costs are given for the purchase of a book (whether it is a duplicate copy of an existing title or a new title) and for a loan. It is assumed that these costs represent the total cost of these operations, and that no other costs are involved.

ii) Document Exposure (cf. III(c)(ii) (d)(iv))

The function used to describe document exposure is based on the negative exponential distribution, and is of the form suggested by Hamburg, Ramist and Bommer (19). The function has a straight-line cut-off at document exposure = 10.124 hours (Loan Period = 2000 hours): in plain language this means that no matter how long the loan period may be, a book will not actually be used for more than about ten hours on average.

As part of a separate research project on fundamental factors affecting the use made of libraries, work is progressing on defining the true nature of this function, and it is hoped that more accurate results will be incorporated into future versions of the Game.

The function presently in use is shown in Fig.3.

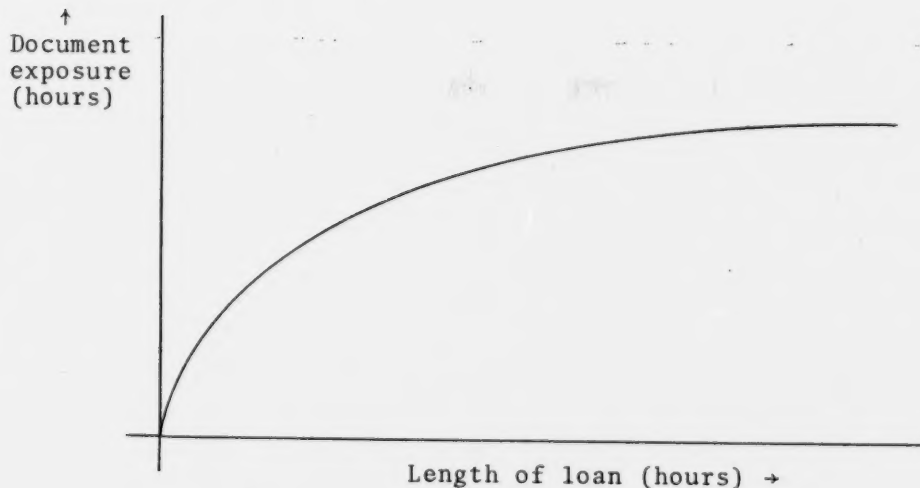


FIG. 3. DOCUMENT EXPOSURE x LENGTH OF LOAN

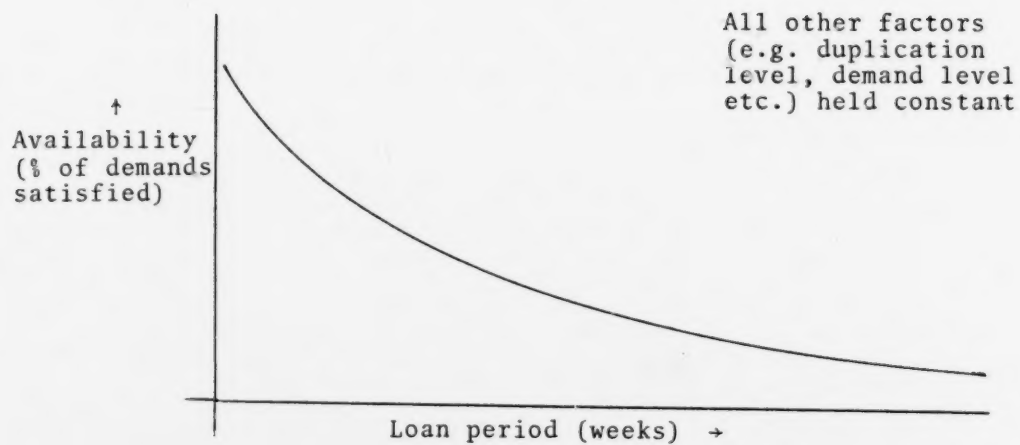


FIG. 4. AVAILABILITY x LOAN PERIOD

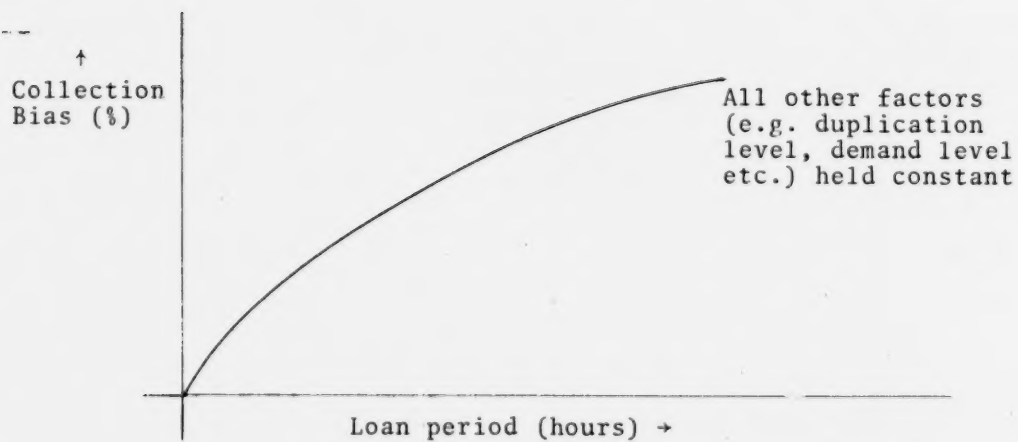


FIG. 5. COLLECTION BIAS x LOAN PERIOD

iii) Availability

Availability (measured by satisfaction level - see p.13) is dependent on a large number of factors and it is therefore difficult to illustrate it in a two-dimensional diagram. However, if all factors except loan period are kept constant, an illustrative graph can be drawn (Fig.4), showing that as the loan period is increased, the availability of the books subject to that loan period will decrease.

iv) Collection Bias

A similar problem occurs with collection bias which is also dependent upon many factors. Fig.5 illustrates its behaviour with respect to loan period when all other factors are kept constant.

v) Demand

It has been found that when a library service is improved there is a tendency for the amount of per capita use made of the library by its users to increase (41). The Game has therefore been designed so that, should the player improve his library service, the number of demands which he must satisfy will increase. This function has been based on our experience at Lancaster University Library.

(d) Evaluation of Results

Consideration of Figs. 3, 4 and 5 will show that it is not possible to maximise all the measures of performance at the same time. If satisfaction level is increased by reducing the loan period the document exposure will decrease, and if the same result is obtained by increasing the level of duplication, this can only be at the expense of increased costs. As in the real situation the librarian must decide the extent to which he is justified in reducing the amount of use made of a book in order to increase its availability. In other words, the Game forces the player to make value judgments, which cannot be evaluated quantitatively.

A further complication arises when one considers the way in which the "library" has developed over the, say, 5-year time-span of the Game. In simple business games, one can assess the participants' performance by measures such as the total profit, but if the level of service throughout the quinquennium is important, there can be no simple method of comparing two players.

The implication of these points is that, in its present version, the Game cannot be used as a competitive exercise - there will be no "winner". Although it has been criticised for this "failing" we feel that the aim of the Game must be to teach students something of the problems which they are likely to face in the real situation - and competition with other librarians is not usually a major part of the librarian's rôle. There is little evidence to show that games which lack a competitive element are any less

effective than those which do include such a facet. Indeed, one of the dangers of using a competitive game is that students can be placed in a position in which they have a strong desire not to lose - and they will therefore play for a draw(38).

A potential difficulty with games is that the student may learn the wrong thing - for instance, a student may become over-confident and be led to believe that loan and duplication policy decisions are by far the most important decisions facing a librarian. This possibility can be reduced by:

- i) Playing the game several times, and drastically changing parameters between each play.
- ii) Ensuring that the purpose of the game is fully explained and understood before play commences.
- iii) Allowing each student to explain his policies to the class, so that a variety of different strategies emerges.
- iv) Ensuring that the game forms an integral part of a complete course, which may allow students to use games concerned with other aspects of librarianship and information science.

V. THE DEMONSTRATION COURSE

A demonstration course, lasting four days, was organised in order to evaluate the game which had been developed and to demonstrate it to members of the library profession. Afterwards we received constructive, written criticism both of the game and of its presentation, and a number of ideas for its future development. The documentation used at the course forms Appendix A.

(a) The Course

The Course was arranged in three parts:

- i) The concept of scientific management, and its application to libraries, formed an introduction to the Course. The rôle and philosophy of operational research were described, and an O.R. study of a university library was presented; summaries of all these papers will be found in Appendix A. The participants also heard a detailed explanation of the terminology which we use, and a description was given of some simple statistical techniques, which would prove useful during the Course.
- ii) A definite task was set, requiring the participants to prepare a set of policies for their libraries over a five-year period, with the aim of providing an optimal library service within a set budgetary limit. The participants, working in groups of two or three, used the computerised game, in conjunction with market research data, to explore their library and to predict the effects of various policies. Their final policies were then presented to a "library committee" who criticised and commented on each library. Finally, the participants were invited to decide which group had, in their opinion, produced the best set of policies.
- iii) During the Course, and particularly towards its end, the participants joined in a number of discussions which sought to answer such questions as: "Is the game, or a development of it, likely to be a useful teaching aid in library schools?" "At whom should such a course be aimed?" "In what way should it be presented?" A short report on these discussions, and on the participants' written reports, will form the remainder of this section.

(b) The Reactions of the Participants

Each participant was asked to record his comments in writing, under a number of headings - it is convenient to use the same headings here:-

i) The feasibility of gaming

All the participants in the course agreed that library (and information service) management games can be developed. This was demonstrated to their entire satisfaction by the prototype game which they themselves were able to examine and use.

ii) The suitability of management games for library and/or information science education

Again, the participants were unanimous in approving management games as suitable tools for library management education. To quote one participant, they offer "a compact, revealing and refreshing way of demonstrating the complex inter-relationships of library processes and emphasise the need for explicitly stated policies which can be measurably tested". However, many felt that they were not really qualified to comment on the Game's suitability in information science, although there seemed to be no obvious reason why the method should not be generally applicable. There was general agreement that in certain circumstances games form the best (if not the only) method of educating students (e.g. one library school lecturer commented: "I learnt more (from the Game) than I did from reading your Occasional Paper. The practical work and team work element by itself ensures that there is greater active participation than in a conventional lecture or seminar"). There was also some discussion about the type of student who would be most likely to benefit from the use of the Game, and, although there was general agreement that a game could be devised which would be suitable for all types of student and all levels of expertise, one or two of the participants felt that, in the first instance at least, games would only be suitable for teaching experienced librarians and library school lecturers (but cf. section (v) below).

iii) Computerisation

There was general agreement that the approach which we have adopted (i.e. the mixed manual/computerised type of game) is the one best suited to the present needs of the users. However, one library school teacher thought that the Game should be completely computerised, so that the student interacted directly with the computer, whereas another felt that the computer was not strictly necessary. It was noticeable that it was the library school lecturers who differed over this point, perhaps reflecting the differing facilities in the schools.

iv) Should the existing game be developed?

Again there was unanimous agreement that the game should be developed by the Library Research Unit, although different opinions were expressed on the way it should be developed. Some participants felt that the aim should be a "complete package, modelling all the major features", whereas others

felt that it would be better to develop a series of packages representing various aspects of the library system. Perhaps the most fruitful approach might be, as one library school lecturer suggested, to develop a series of compatible models which could be used individually as complete games, with the ultimate aim of linking these models to form a comprehensive package. A more specific suggestion for the Game's development was that "one or two schools of librarianship (should become) linked with (the Game's) development so that the teaching aspect is experienced 'in the field' and there is direct feedback of information". It was suggested that a number of schools "are beginning to specialise in management and these are perhaps the most obvious schools to be associated with the project".

v) How should the game be presented?

There would appear to be two possible approaches to this problem. The games could be integrated into the existing syllabuses to form an integral part of library school courses, or they could form the bases of short courses, primarily aimed at experienced librarians. These courses could be run by the library schools or by other bodies such as the Library Research Unit.

The majority of the participants were of the opinion that management games are suitable for all types of student and that they could therefore be used both within the library schools' syllabuses and as part of short courses. A minority felt that, at least for the present, they should be restricted to experienced librarians and library school teachers. In either case, all agreed that it would be necessary for the Library Research Unit to provide some kind of training for the organisers of the courses, by close liaison with the schools, or by holding courses at Lancaster, or by individual secondment. In addition it was felt that the Demonstration Course, because it is such a valuable introduction to the method, should be repeated for a wider field of participants.

vi) Further comments

Although it is true that attitudes are gradually changing, the library school representatives felt that the traditional opposition to innovations in education should not be underestimated. Many library schools are tied to syllabuses prepared by the Library Association which leave little time for work other than that which is directly relevant to examinations. The position is gradually improving, and is particularly helped by the fact that library schools are beginning to design their own syllabuses in detail, particularly those offering CNA and post-graduate courses.

VI. LIAISON WITH LIBRARY SCHOOLS AND OTHER INTERESTED BODIES

A considerable amount of time has been spent in visiting library schools and other interested bodies with the object of familiarising ourselves with the schools' teaching practices, and also to ascertain the reactions of the profession to our research. Many of our findings are similar to those contained in the report which forms Appendix D, but the lecturers' reactions to the game are summarized below:

(a) Teaching Management

Almost without exception, library school lecturers, and particularly those concerned with management, are aware of the need for a more scientific approach to problems in this field. However, they are generally unsure of the level at which management education should be applied - should all librarians be aware of management techniques, as they apply to libraries, or should courses be held in order to train "middle management"? These were some of the main queries which emerged from our talks with the staff of library schools and figured prominently in the questions asked of participants at the demonstration course (cf. section IV above).

(b) The Courses

Most library schools offer more than one course in librarianship - the postgraduate course is usually the most intensive, and there is often little time for the inclusion of items which are not part of the syllabus. A similar position holds with respect to the 2-year ALA course, and it is generally felt that changes in these courses must await rearrangement of the Library Association syllabuses. There are, however, signs that the library schools are beginning to have more direct influence in the design of these courses.

The position in the CNAAL courses is somewhat different. These courses are much longer, lasting three or four years, and the schools set their own examinations - although the syllabus must, of course, be approved by CNAAL. There is therefore scope for the introduction of new topics into the syllabuses and for some experimentation.

A few library schools also offer short courses, usually aimed at experienced professional librarians. These cover almost all aspects of librarianship, but can conveniently be categorised into two main types - "refresher" courses whose main aim is revision, and those courses which introduce completely new topics. Each course is devoted to one fairly narrow subject, and it was generally felt in the library schools that the Game might best be used as part of such a course, at least in the first instance.

(c) Reactions to the Game

Almost without exception library school lecturers have shown enthusiasm for the Game. They have recognized for some time that there are grave difficulties in systematically teaching management by traditional methods, especially to students who are not particularly numerate, and many lecturers are aware of the deficiencies in the present day management of libraries. The generally favourable attitudes to the Game are reflected by the willingness of lecturers to run trial courses in their schools.

(d) Facilities

A brief report on the computer facilities which are available to the schools is given in section VIII(b) below.

(e) Library Schools in the U.S.A.

American library school teachers have, if anything, been even more enthusiastic about the Game than their British counterparts. We have received a number of requests from them for copies of the Game program, and a number of library schools have indicated their willingness to incorporate the Game into their courses, and to help us with development work.

VII. RELEVANCE OF GAMING TO OTHER TYPES OF INFORMATION SERVICE

During the feasibility study we have concentrated on the managerial problems of academic libraries. This does not mean that the problems of other types of library and information service have been neglected - we have spent a considerable amount of time in visits to, and discussions with, interested parties in this field. Our conclusions are summarised below:

- i) Theoretically, there is no obvious reason why games should not be used to teach information science. The main requirement before a simulation-game can be designed is the existence of a model describing the system. For instance, indexing can be taught by allowing students to use a computerised retrieval system. In the same way, once the management problems of information services have been identified and modelled, there is no theoretical bar to their use as games.
- ii) One of the most widely identified management problems is that of staff allocation between various tasks, and, as mentioned in section XI below we hope to develop a game which investigates this problem in a library. In information services, staff are often required to be expert at various tasks, and since the staff of an information unit is usually much smaller than that of a library, the problem is often more acute.
- iii) There are a number of other common problems which confront the managers of information services and libraries. Budgetary problems - the allocation of resources - are all-important and extremely similar (e.g. how should a total budget be divided between staff and books or other materials?) Further, the inter-library loan function of a library is similar to that of an information service.
- iv) In general, the problems of information services are similar to those of libraries, and games developed for one should be applicable, when modified, to the other. However it is only fair to stress that the modifications required, though not complex, could well be lengthy and time-consuming, because of the difference in attitudes which is often apparent between managers of the two types of service, and the different frameworks within which they operate.

VIII. COMPUTERISATION

(a) How much?

All games require the use of a computer: the simplest use a set of rules which the participants enforce collectively, while the most complex require a large electronic computer to evaluate the play. The design of the game depends on the objectives of the game and the resources available. Each type of design has advantages and disadvantages, and it is necessary to weigh these in the balance before deciding which is the most suitable. The most important disadvantages of the two extreme types of game (i.e. those which make no use of a calculator and those which make full use of an electronic computer) are summarised below and in Fig.6.

i) Games which do not use a computer

- (a) The game must be either very simple or very general or a very large amount of time must be spent in calculating results.
- (b) Some of the students' time will inevitably be wasted either in waiting for results or in waiting for other students to take decisions.
- (c) The game will tend to be inflexible and it will be difficult to introduce random variations.

ii) Games which rely solely on a computer

- (a) The game will inevitably be more expensive to run than a purely manual game.
- (b) Many students are unfamiliar with computers and may be distrustful of them.
- (c) The student can only choose one of a number of pre-programmed courses of action and the game is therefore inflexible.

We therefore considered that the most suitable type of game (at least for demonstration purposes) would be one which combined the advantages of the two extreme types. A "mixed manual/computer-aided" type of game was therefore developed and evaluated. It retains the disadvantages that the students' time can still be wasted while the results of his decisions are calculated (due to the reduced efficiency of the input channel) and the game remains fairly expensive to run. However, a mixed manual/computer-aided game has the great advantage of increased flexibility - the need to predetermine courses of action is largely removed by the presence of a game-editor who translates the participants' decisions to machine-readable form, and the need to predetermine results is removed because these are

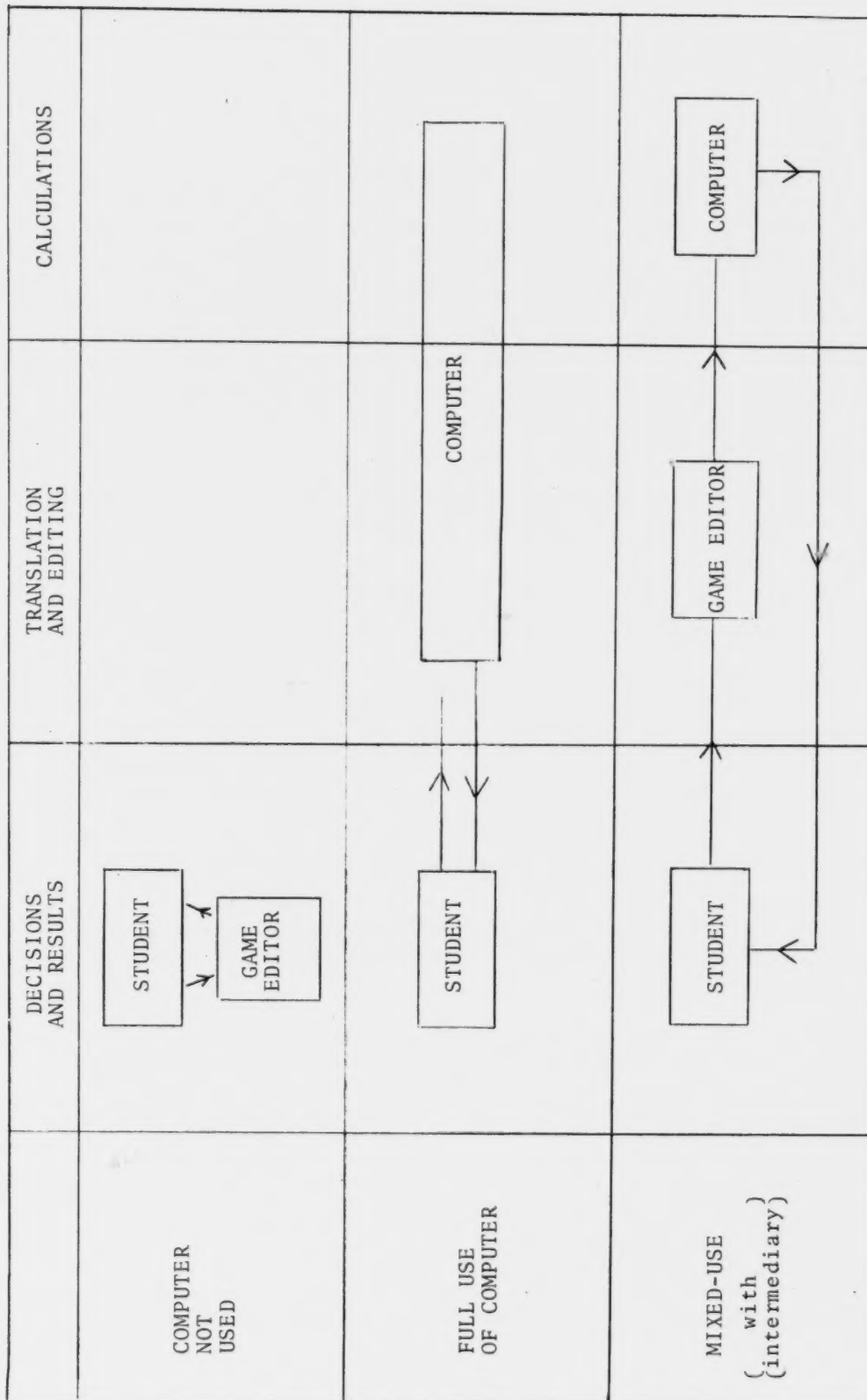


FIG. 6. USE OF COMPUTERS IN MANAGEMENT GAMING

dependent on the input, which is itself extremely variable.

We feel that this solution will probably prove to be the most effective in the schools, although some lecturers would prefer a completely computerised game.

(b) Facilities available in the schools

A survey has been conducted to determine the type of computer facilities available in the library schools - the results are contained in Table 1. As can be seen from these results, the majority of schools have access (perhaps limited) to on-line computer facilities, and more will have such facilities in the near future. We therefore feel justified in designing games which require the use of a terminal, although we do feel that the needs of the minority who have no such facility should be considered (cf. section XI).

	ON-LINE FACILITIES AVAILABLE	OFF-LINE (BUT NOT ON-LINE) FACILITIES AVAILABLE	NO COMPUTER FACILITIES
1971/2	9	3	3
Predicted availability in the "near future"	12	2	1

TABLE 1. The number of British Library Schools having access to computer facilities.

IX. COSTS

As with all costing activity, it is important here to determine the objective of the exercise. The analysis of educational costs is fraught with difficulty; education is a fundamental requirement of our society, and yet it is virtually impossible to put a concrete value on its end product. It is important to recognise that the management game is intended to form an integral part of a course in librarianship, and its cost should be viewed in the context of its effectiveness in achieving educational objectives.

(a) Costing formula

The normal accounting formula is:

Total cost = Direct cost + Indirect cost.

Each of the components, direct and indirect, can be further divided into labour, materials and services. We will discuss these as they relate to the library management game.

(b) Indirect costs

These cover the overheads involved in using the game - the rent of space for participants to sit, heating, lighting etc.; also an element representing the capital cost of the game itself. For the purposes of this exercise we can ignore indirect costs since

(i) overheads depend on the institution in which the game is used.

(ii) the capital for developing the game has been provided by the State.

Naturally in a commercial full-cost recovery operation, an element for capital charges would be included.

(c) Direct costs

To a large extent, the cost of the Game depends on how it is used. Unrestricted use by ill-informed players will become very expensive. The purpose of the Game is to demonstrate interactions which cannot easily be illustrated by other means. The Game cannot stand alone, but it would be a mistake to say that its costs should include the cost of the lectures and discussions required to put it in context. The use of the Game implies that the course of which it forms a part should have an orientation towards scientific management; in the early stages of development it may be necessary to organise special courses to demonstrate the Game, but it should eventually take its place as a part of the normal curriculum. We can thus justifiably limit the analysis to the direct costs of operating the Game.

i) Materials

In the Demonstration Course (cf. section V) participants

in the game were given a manual containing data on the library being simulated. The cost of producing this manual and various documents (reproduced in Appendix A) should not exceed 11p per student.

ii) Labour

In its present form, the Game requires an editor and a teletype operator to maintain a reasonable turn-round of results. This costs about 20p to produce results for one library for one year (i.e. one "run").

iii) Computing

The computing cost is dependent on the source of computing power. In the development of the Game, a commercial time-sharing bureau has been used. This is probably more expensive than using an in-house computer, so these figures can perhaps be regarded as a maximum. In the system used, there are three different charges:

- (a) Telephone line rental. This includes the cost of installing and renting the line, and the cost of the calls themselves. The latter becomes quite significant when a long-distance line has to be kept open for several hours.
- (b) Computer resource units. These are charged on the basis of the amount of time taken by the program to perform calculations, etc. in the computer.
- (c) Terminal connection charge. This is charged at a fixed rate on the basis of the length of time during which the terminal is actively connected to the computer.

During the Demonstration Course, item (a) accounted for 50% of the computing cost (including the line installation charge - about 30% of the total), item (b) accounted for 20%, and item (c), 30%. (These percentages are dependent on the length of the course, the program size, and a variety of other factors). The total cost was 14p per minute - say, 70p per run.

The total cost of running the Game will depend on the number of runs allowed. In a three hour session, it should be possible to get 36 runs. Allowing one run per half-hour to each group of three students, the total cost would be not more than £36 - £1 per run or £2 per student.

In an educational institution operating its own computer facilities, it is unlikely that any actual charge will be made, although the true running cost will be about one-quarter of the commercial charge. Thus the cost of the game will be limited to labour and materials costs - say 25p per run or 50p per student.

(d) Alternative types of game

The Game so far developed is a mixed manual/computer-aided version. This form of the Game can be used by about six groups of students simultaneously.

(i) Completely manual game

The cost here would be apparently quite small, but a considerable amount of off-line computing would be required to provide the game editor and the participants with sets of tables, graphs, etc. to replace the on-line calculations.

(ii) Completely computerised game

The costing of this type of game is difficult since we have no actual example on which to conduct tests. However, during the development of the "mixed" game, we demonstrated it to a number of visitors, using an on-line mode. The following points may be noted:

- (a) Since only one person may use the terminal at any one time, it may prove difficult to group participants.
- (b) The main constraint on the service time is the amount of printing required, and this is much greater when no game editor is present.
- (c) If unreasonable delays are to be avoided, the capacity of the terminal would be reduced to about three persons.

Using the same costs as before, this gives a figure of about £1-50 per run, or £8-50 per student. If it were possible to group the students, the per-student cost for six runs per group of three would come down to £3, which is still 50% greater than with the mixed game.

(e) Conclusion

A completely computerised game would cost about four times as much as the mixed manual/computer-aided game. It is important to realise that the costs depend on how the game is used. It would seem sensible to restrict the number of runs allowed to each participant; and in an educational institution, in which computing services are supplied on the same basis as library services (i.e. not charged for), the cost of running the game is of the same order of magnitude as the cost of a conventional lecture or seminar extending over the same period.

X. METHODOLOGY FOR THE EVALUATION OF LIBRARY AND INFORMATION SERVICE MANAGEMENT GAMES

The evaluation of management games in librarianship and information science must take account of two main queries:

- (i) Is the management game capable of attaining its educational objectives?
- (ii) Is the management game acceptable to the teaching profession, and is it likely to be used?

Although there is inevitably some overlap between these two questions, we have designed separate methodologies to answer them. (The Demonstration Course is itself designed to answer both questions, and is covered in detail in section V and Appendix A).

(a) Is the game educationally valuable?

One aspect of the development of a game must be its testing in the situation in which it will be used; we intend that the prototype game developed during this feasibility study should be tested in one or two selected British library schools in the near future, using library school students as "guinea-pigs".

Questionnaires have been designed to test our hypotheses about the game, although these should be modified to the more-useful interviewing technique wherever possible. The questionnaires are reproduced in Appendix C, one being used after the game has been played, the other both before and after. They will test the following hypotheses:

- i) The Library Management Game increases motivation and interest.
- ii) The Library Management Game increases learning.
- iii) The Library Management Game improves student attitudes to the course.
- iv) The Library Management Game increases the student's confidence in his own ability.
- v) The Library Management Game improves the student's ability to express himself clearly.

Although much of this evaluation must be based on subjective judgments, we nevertheless hope to identify significant trends by allowing the students to quantify their own assessments. The students will also be asked to criticise the game and to make suggestions for its future development.

(b) Is the game acceptable?

This question has been answered, at least in part, by the responses of library school lecturers to the Game, both when it has been explained verbally (during liaison with the library schools) and when the lecturers have had an opportunity to use it themselves, during visits to the Research Unit and in the Demonstration Course. The Demonstration Course was our most powerful tool in this part of the evaluation, as it provided both a thorough introduction to the game and an opportunity to discuss and criticise it. It should therefore be emphasised that the purpose of the demonstration course was not to train lecturers in the use of the Game but to familiarise them with it and obtain their considered views of its potential.

XI. FURTHER RESEARCH

We believe that the work described in this report has succeeded in establishing the feasibility of designing and using management games in the education of librarians and information officers. It is important that these games should be developed and we suggest that research should continue along the lines set out below:

- (a) The development of the use of gaming in library management education especially in the library schools. This is a problem of information and communication - in the first instance it may be necessary for the research team to assume some of the responsibility for development work within the schools.
- (b) Further development of the Game which was produced during the feasibility study, to include a number of new areas:
 - i) Non-zero obsolescence, and other complex interactions.
 - ii) More realistic costing data.
 - iii) The possibility of allowing the Game to be "won" should be considered.
 - iv) A series of packages, suitable for different groups of students, should be developed.
- (c) Exploration of new areas of librarianship and information science which have management problems susceptible to the gaming technique, and development of new games to take account of these.
- (d) Continuous evaluation of the products of the research.

Acknowledgments

The authors gratefully acknowledge the invaluable encouragement and guidance of Mr. D. Hicks throughout the project, and his help in the detailed planning of the Feasibility Study.

Our thanks are also due to the many library school lecturers, information scientists and librarians who went out of their way to help us, and particularly to Mr. L. C. Guy, Senior Lecturer at Ealing Technical College, who was commissioned to write a report on the state-of-the-art of library management education (see Appendix D).

Mr. K. Croston, Senior Programmer in the Department of Operational Research was responsible for programming the Game, and Miss J. B. Nisbet of the Department of Educational Research provided advice on the design of the questionnaires.

Any inaccuracies or errors remaining in this report are of course the responsibility of the authors.

APPENDIX A

The Demonstration Course

The purpose of the Course was to demonstrate the Game. Since the Game uses concepts which are not widely understood the Course commenced with an introduction to the concept of scientific management and its application to libraries (summaries of these papers appear below). The gaming situation was described, and the participants were given a manual containing all the information relevant to the decisions required (p.39). An example of the Game in use will be found in Appendix B.

(a) Introduction to the Gaming Situation

The rôle of the participants in the Game was explained briefly - they would be expected to act as librarians in charge of a library with certain defined characteristics, and market research data would be available (see the Appendix to the Course Manual, p.43). The computerised simulation would take the rôle of the library, and would react according to the librarian's decisions. Communication between the librarian and his library (policy decisions) and between the library and the librarian (measures of performance) would take place through a game editor. The situation is shown below in Fig.7.

(b) Operational Research

Operational Research is defined as the application of the scientific method to problems of decision making in complex organisations; as a distinctive approach to the evaluation of managerial policy, strategy and tactics. The centrality of the concept of a 'mathematical model' representing the important aspects of the real decision situation was illustrated. An example of a mathematical model was constructed to deduce an optimal decision for a doctor faced with alternative treatment possibilities for a hypothetical patient. The concept of 'optimisation' was discussed and the relevance of the OR approach on the existence of 'measures of effectiveness' for the system was highlighted. The relevance of OR to management gaming was demonstrated with reference to their common reliance on a mathematical (or simulation) model of the organisation under consideration; although certain differences between a gaming and an operational model were illustrated.

(c) Loan and Duplication Policies

The effect of loan and duplication policies on availability was described, given various levels of demand. For instance, with a given level of demand, the availability of books is inversely related to the length of time for which they are borrowed (Fig.8). A number of

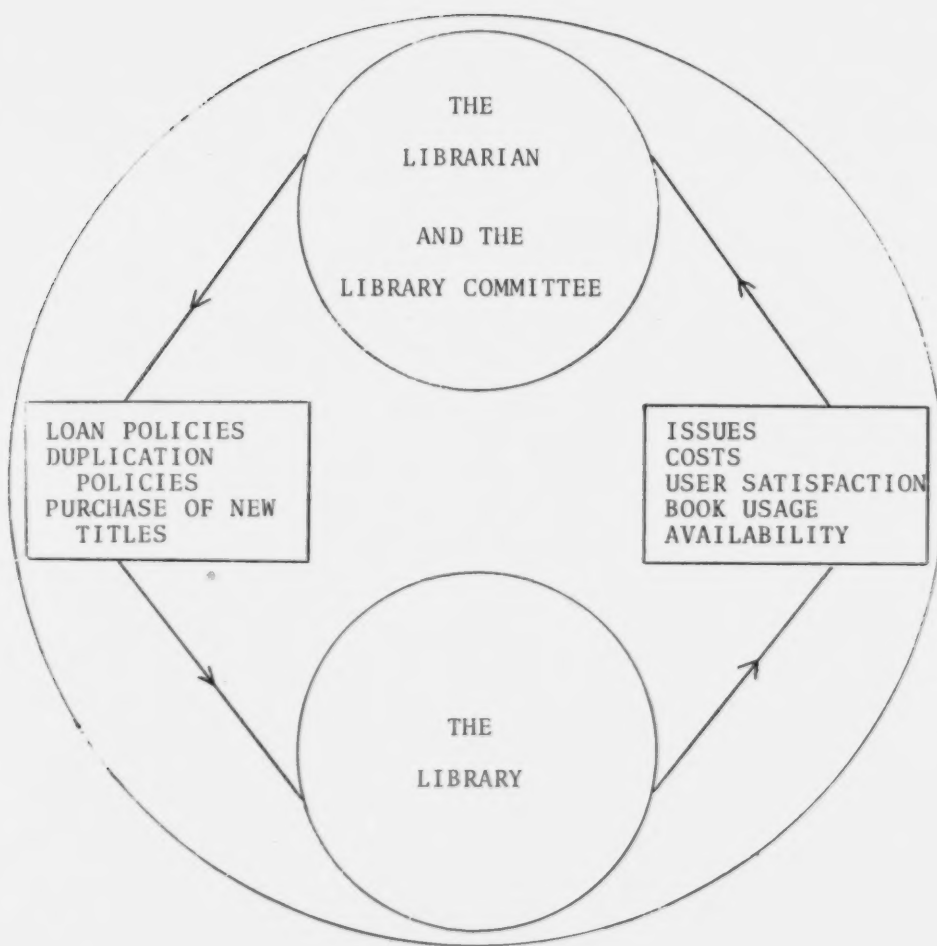


FIG. 7. THE GAMING SITUATION

other important functions were described. For instance, the relationship between the loan period and the retention time was found by the participants from data provided in the Course Manual (see p.39) after they had been shown how to analyse this data graphically, (Fig.9).

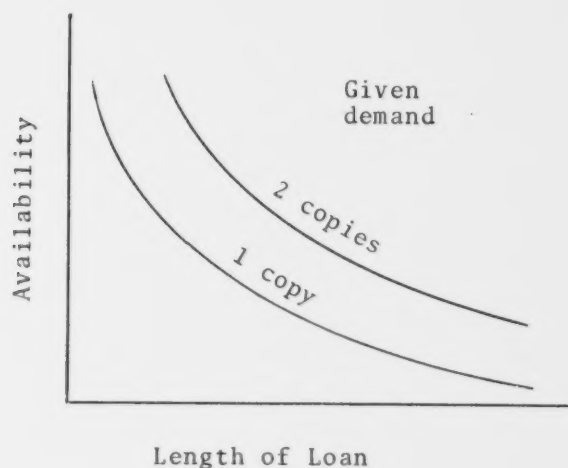


FIG. 8.

AVAILABILITY AS A FUNCTION OF LOAN PERIOD

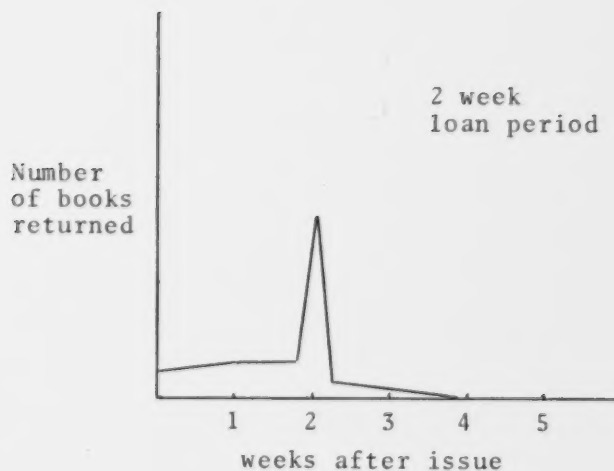


FIG. 9.

THE LENGTH OF TIME FOR WHICH BOOKS ARE RETAINED

(d) The Course Manual

The Course Manual which was provided for the participants contained a detailed description of the Course and data provided by a hypothetical consultancy company, Market Research Ltd. The Manual is reproduced on the following pages together with the literature and forms used during the Course.

UNIVERSITY OF LANCASTER
LIBRARY RESEARCH UNIT

Short course:

The use of gaming methods in teaching library management

8th - 12th March 1972

COURSE MANUAL

I. INTRODUCTION

The Library Management Game is in many ways a continuation of previous work at Lancaster on the systems analysis of the library. It makes use of some of the findings of the earlier studies, particularly those relating to loan and duplication policies. (cf. 'Systems Analysis of a University Library - Final Report on a Research Project' by M.K.Buckland and others, University of Lancaster Library, Occasional Paper No.4, 1970). When this project ended in June 1969, work on library stock control was continued. Meanwhile we had become interested in the potential for using these models educationally - as a library management game.

A proposal was accepted by OSTI in December 1970 to perform a study of the feasibility of computer-based gaming in education for the management of scientific and technical information systems and libraries. The feasibility study was scheduled to last one year, and expires in June 1972. It is part of a programme of research in the field of library management at Lancaster.

It was decided to develop a prototype game during the feasibility study based on the computerised simulation of part of a library. The present course is not presented as a 'production model', but rather as a prototype. The participants are invited to assess the potential of this type of gaming as an educational tool in the library/information science world.

It is likely that a 'package' will eventually be developed in the light of experience, but we must emphasise that the present OSTI grant was only for a feasibility study.

II. THE RÔLE OF THE PARTICIPANT

The participant will be in the position of the newly appointed director of an existing library which caters for a fairly narrow, well-defined scientific subject. Special budgetary arrangements are in force concerning non-monograph literature and an allowance for the purchase of monographs which exactly matches the effects of obsolescence on monograph stock. Therefore journals and the effects of obsolescence are outside the scope of the present simulation.

The results of a number of surveys of the library, carried out by Market Research Ltd., are available to the participant (see Appendix I). The participant must analyse and interpret these data himself. They will be the same for each participant so that it will be possible to compare the final results. It should be emphasised, however, that there is no single optimum solution to the problem.

Further information will be available from the output of a computerised simulation of the library. The computer will predict the likely consequences of any set of decisions which the participant may make, and will print out the results in the form of new values of the output parameters. The output parameters are:

- a) Satisfaction level
- b) Document exposure
- c) Collection bias
- d) Number of issues
- e) Costs

These are defined in Appendix II (p.46)

The task facing the participant is described in detail in the next section.

III. THE TASK

Each participant will present a claim for a quinquennial budget to the library committee. He will be expected to justify and defend it. The claim should include the following:

1. A Request for Resources

- a) A request for a total budget for the five-year period. The committee may ask for an annual breakdown.
- b) The request should include an allocation between the purchase of books and the provision of services, cost of issues etc.

2. A Statement of Policy

A statement of the objectives of the library, together with a description of the measures which will be used to judge performance with respect to these objectives. The statement should include an indication of how these measures will be estimated.

3. Operational Policy Statement

- a) Loan Policy - A description of the loan regulations which will be in force.
- b) Duplication Policy - The level of duplication and procedures for identifying the titles to be duplicated.
- c) Purchase of New Titles - The number of new titles which will be purchased.

4. Evidence for the Case

An estimate, based on the simulation results, of the performance to be expected from the library with the resources specified in 1, the objectives given in 2, and the methods outlined in 3.

IV. THE SCOPE OF THE SIMULATION

The simulation is intended for use as a management aid. It will be used to provide information in the light of which decisions can be made and their effects evaluated.

The input to the computer (which will be operated by a member of the University staff who is closely involved with the project) consists mainly of:

- a) Loan Periods - defined in terms of the number of titles and/or the number of borrowers subject to each loan period.
- b) Duplication - defined in terms of the number of extra copies to be bought and the number of titles to be duplicated.
- c) New Titles - defined in terms of the number of new titles to be bought.

The simulation is run and the first year's results are produced. The computer stores a copy of these results and waits for a new combination of loan and purchasing policies to be input (N.B. For the second and subsequent years, the starting point of the library will be the results of the previous year. The previous years' results will be over-written by the computer and lost. However, the library may be returned to its initial starting point at any time). Each participant's 'library' will be identified by a unique number, and will thus be unaffected by any decisions which other participants may make.

It should be noted that the demand on the library in a given year may be affected by the performance of the library in previous years. In particular, a successful library may stimulate demand.

APPENDIX I

MARKET RESEARCH LTD.

RESULTS OF SURVEYS CARRIED OUT IN LIBRARY

Investigation of the Distribution of Issues

A 1 in 100 random sample of all the books in the library was chosen. The date-label of each book was examined to determine the number of times that the book had been issued during the previous year, (Table 2). Books which were on loan and in the sample were checked on their return to the library. All items in the sample were traced, and the reliability of the results is therefore wholly dependent on the randomness of the sample.

Number of issues during the year	0	1	2	3	4	5 or more
Number of titles	40	24	17	10	6	3

TABLE 2

The Distribution of Demands

A similar method of sampling (again 1 in 100), from the population of users rather than that of books, was used to determine the distribution of the demands on the library (Table 3).

Number of demands, x, for a book during the year	0	1	2	3	4	5 or more
Percentage of demands which are for books in category x	0	13.2	21.6	22.8	22.6	19.8

TABLE 3.

APPENDIX I

MARKET RESEARCH LTD.

RESULTS OF SURVEYS CARRIED OUT IN LIBRARY

The Duplication of Titles

A survey of the library's stock revealed that there is no duplication whatsoever. That is, there is only one copy of every title held.

The Amount of Actual Use (Document Exposure)

For this survey the new measure of performance, document exposure (cf. Appendix II), was used. A random sample of readers was questioned as to the amount of time that they spent actually reading the books which they borrowed. The results showed that, on average, the longer a book is on loan, i.e. the greater the retention time, the more it is used. (Table 4).

Length of time book is kept on loan (days)	1	2	5	10	25	50	100
Average amount of actual use (minutes)	214	227	263	317	445	564	607

TABLE 4.

Costs

Costs were broken down into two categories - those concerned with issues (i.e. service desk staff, etc.) and those concerned with the acquisition of duplicate copies (ordering, purchasing, classifying, cataloguing, etc.). The individual costs of each of the separate processes have been combined to produce two averages:

- a) Cost of issuing a book = 10p
- b) Cost of purchasing and processing a book = £6-00

APPENDIX I

Retention Times

Three similar libraries were visited by the staff of Market Research Ltd. and data were collected on the length of time books were kept out. (i.e. the retention time). Data Collection days were staggered to ensure that the data did not reflect the days on which the library was closed.

Days	LIBRARY A (7-DAY LOAN)	LIBRARY B (14-DAY LOAN)	LIBRARY C (28 DAY LOAN)	Days
0	110	-	3	0
1	147	306	12	1
2	139	274	7	2
3	152	306	10	3
4	155	366	12	4
5	206	227	17	5
6	474	246	15	6
7	2236	410	20	7
8	534	270	12	8
9	173	176	7	9
10	105	219	8	10
11	91	305	11	11
12	85	236	9	12
13	84	458	18	13
14	88	1343	19	14
15	22	558	15	15
16	17	210	10	16
17	19	169	18	17
18	9	137	17	18
19	8	100	13	19
20	8	62	16	20
21	7	120	19	21
22	0	63	12	22
23	-	25	20	23
24	-	44	28	24
25	-	30	24	25
26	-	30	33	26
27	-	21	52	27
28	-	26	133	28
29	-	-	32	29
30	-	-	16	30
31	-	-	20	31
32	-	-	14	32
33	-	-	14	33
34	-	-	17	34
35	-	-	13	35
36	-	-	4	36
37	-	-	1	37
38	-	-	6	38
39	-	-	2	39
40	-	-	0	40
41	-	-	1	41
42	-	-	0	42

TABLE 5

APPENDIX II.

THE OUTPUT PARAMETERS

1. SATISFACTION LEVEL - (usually expressed as a percentage)

In a given time period (in this case one year) the satisfaction level is defined as the percentage of demands which are satisfied immediately. Alternatively, it may be defined as the probability that a borrower will find the book for which he is looking.

SATISFACTION LEVEL SHOULD BE MAXIMISED

2. DOCUMENT EXPOSURE - (usually expressed in hours)

Document exposure is defined as the amount of actual usage ("eye-to-page contact") which an individual book receives during the period it is on loan to a single reader. In the simulation, document exposure is output as:

- a) The total amount of actual usage of all the books in the library during the year.
- b) As the average document exposure per issue.

DOCUMENT EXPOSURE SHOULD BE MAXIMISED

3. COLLECTION BIAS - (usually expressed as a percentage)

In the majority of libraries the most popular books are removed from the shelves by borrowers. When another borrower comes to the shelves he finds that the collection is 'biased' towards the least-popular books. Collection bias is a measure of the extent of this bias, and is defined as the percentage of the 10% most popular books which is absent from the shelves. It is hence a measure of the suitability of the library for browsing.

COLLECTION BIAS SHOULD BE MINIMISED

APPENDIX III.

Characteristics of Library ____ in Year O.

<u>SATISFACTION LEVEL</u>	=	55.4%
<u>DOCUMENT EXPOSURE</u>	=	138779.5 hours
<u>COLLECTION BIAS</u>	=	57.7%
<u>NUMBER OF ISSUES</u>	=	13855
<u>LOAN PERIOD</u>	=	<u>10 weeks</u> for all users and all books

LIBRARY MANAGEMENT GAME
SUPPLEMENT TO COURSE MANUAL

LIBRARY NUMBER

At the request of the Library Committee, Market Research Ltd. were invited to provide the librarian with certain additional information which had not previously been made available. The following supplementary information has been supplied and should be noted in the Course Manual.

- (a) The library is a small academic library with 1000 registered borrowers. The user population is static; it will neither increase nor decrease during the quinquennium.

(b) The Distribution of Borrowers by Status

An investigation of the status of each borrower of a sample of books was carried out and produced the results tabulated below:

Number of times issued during the year	1	2	3	4	5 or more
Total issues (1 in 50 sample)	48	68	60	48	30
Issued to academic staff	4	5	5	4	2
Issued to post-graduate students	4	5	5	4	2
Issued to under-graduate students	40	58	50	40	26
Issued to other users	0	0	0	0	0

TABLE 6.

UNIVERSITY OF LANCASTER LIBRARY RESEARCH UNIT
LIBRARY MANAGEMENT GAME

Describe your policies in detail on this form and hand it to the Game Editor. He will translate it into machine-readable form and will return your results to you.

LIBRARY NUMBER: _____

LOAN PERIODS

DUPLICATION

PURCHASE OF NEW TITLES

Do you wish your library to return to year 0 before these changes are made? YES/NO

FIG. 10. Form used by participants

LIBRARY NUMBER	-----
LOAN PERIODS	-----
DUPLICATES	-----
TITLES	-----

This form is not to be used by participants

FIG. 11. Form used by Game Editor

LIBRARY NUMBER

Year, Y	Loan policy	Duplicates bought	Titles bought	Satisfaction level (%)	Total document exposure (hours)	Average document exposure per issue (hours)	Collection bias (%)	Total issues	Cost in year Y (£)	Total cost to date (£)	
0	10 weeks	0	-	55.4	138779.5	10.016	57.7	13855	0	0	

FIG. 12. Participant's record sheet

RESULTS

The policies eventually chosen by each of the six groups of participants, and their effect on their libraries, are shown in Table 7 below. They were attempting to work within a total budget for the five years of £17,000, although this did not have to be closely observed. Each group of participants presented a written summary of their proposed policies to the committee, which then discussed them, bearing in mind the following questions:

- (a) Is there a reasonable division of the budget between books and services (taking into account the special allocations for serials and monographs which offset obsolescence)?
- (b) How is the budget broken down annually? Are there any significant trends?
- (c) How will the policies be implemented? For instance, stating criteria which involve the number of issues over the past year is better than stating criteria which make a certain percentage of stock subject to a given loan period, because the former is immediately meaningful to service-desk staff (assuming date-labels are used), whereas the latter is not.
- (d) What are the objectives of the library? And why is emphasis placed on one measure of performance, possibly at the expense of another?
- (e) What would be the effect of changing the policies? How sensitive is the library to such changes?

POLICIES

STATE OF THE LIBRARY AT END OF YEAR 5

Library	Loan policy	Duplicates bought over 5 years	Titles bought over 5 years	Satisfaction level (%) in year 5	Total document exposure(hours) in year 5	Average document exposure per issue (hours) in year 5	Collection bias (%) in year 5	Total issues in year 5	Total cost (£) over 5 years	Total cost of issues (£) over 5 years
1	3 days and 10 weeks (note 1)	625	100	81.99		7.012	0.01		17188	13838
2	2 weeks 4 weeks 8 weeks (note 2)	122	150	94.13	217351	6.455	10.57	33673	17388	15936
3	2 days and 4 weeks (note 1)	80	300	94.84		5.972	0.01	33083	17868	15468
4	1 week and 4 weeks (note 1)	100	160	94		6.5	1.8	33000	17212	15652
5	3½ days 10 weeks (note 1)	375	200	82.75	193803	7.088	0.01	27344	16500	12480
6	1 week 7 weeks (note 1)	200	500						17302	13102

Note 1 - Defined by the popularity of the books

Note 2 - Defined by the type of user

TABLE 7.

Demonstration Course: Results obtained by Participants

APPENDIX B

An example of the Game in use

The left-hand column represents input to and output from the computer terminal; input (by the game editor, acting for the player) is underlined in this example for the sake of clarity. Players receive only the output for each "year".

The right-hand column is a clarification of the meaning of each transaction which takes place at the terminal; these are lettered (in this example only) for ease of reference.

For illustrative purposes, the example shows one player ("library") playing the game for three "years"; in fact up to ten players can take part simultaneously, for an indefinite number of years.

A key to some of the headings used in the output is given below:

SAT. LEV	- Satisfaction Level (%) (p.13)
COL. BIAS	- Collection Bias (%) (p.13)
DOCUMENT EXPOSURE	- Document Exposure (hours) (p.13)
AV.DOCEXP PER ISSUE	- Average amount of document exposure per issue (hours)
DUPS. BOUGHT	- Number of duplicates bought
TITLES BOUGHT	- Number of titles bought
INC IN SL/£	- Increase in satisfaction level per pound expenditure
INC IN DEXP/£	- Increase in document exposure per pound expenditure

[illegible]

M

88.00
94.00
57.00
68.00
79.00
93.99

M - See 'I' above

N

RESULTS FOR LIBRARY 1 IN YEAR 2	COL. BIAS	DOCUMENT EXPOSURE	NO. OF ISSUES	AV. DOCEXP PER ISSUE	DUPS. BOUGHT	TITLES BOUGHT
LEV. SAT.	76.78	8.00	142456.1	19295	7.363	0

N - See 'J' above

O

BOOKS HELD	TITLES HELD	YEAR'S COSTS	COSTS SO FAR	INC. IN SL/i	INC. IN DEXP/i
10000	10000	1929.5	3325.4	0.0111	1.3656

O - The cycle restarts. The player is not satisfied with the results, and wishes to adopt a different set of policies; by inputting "-1" (i.e. the negative of his library number) he commands the computer to forget all that has gone before, and return to year 1.

WHICH LIBRARY ARE YOU? -1

P

LIBRARY NUMBER 1 RESTARTED AT YEAR ONE

P - The message is acknowledged in plain text.

Q

? 700	700	700	700	700	700
? 0	0	0	0	0	0
? 0	0	0	0	0	0

Q - The player wishes to leave all books on 10-week loan for all users except undergraduates, who will be allowed to borrow books for only 3 weeks. The game editor consults Table 6 (page 48) and notes that undergraduates borrow 5/6 of the books in each popularity class. So the average loan period in each class will be $(\frac{1}{6} \times 1680) + (\frac{5}{6} \times 504) = 280 + 420 = 700$ hours.

He therefore inputs "700" six times. No duplicates and no new titles are bought.

R

R - See 'I' above.

S

LIBRARY NUMBER 1 RESTARTED AT YEAR ONE
RESULTS FOR LIBRARY 1 IN YEAR 1

SAT. LEV.	COL. BIAS	DOCUMENT EXPOSURE	NO. OF ISSUES	AV. DOCEXP PER ISSUE	LUPS. BOUGHT	TITLES BOUGHT
76.53	34.39	151322.9	19251	7.669	0	0

T

BOOKS HELD	TITLES HELD	YEAR'S COSTS	COSTS SO FAR	INC. IN SL/f	INC. IN DEXP/f
10000	10000	1923.1	1923.1	0.0110	6.5225

WHICH LIBRARY ARE YOU? 1

? 700	700	700	700	700	700
? 200	0	0	0	0	0
? 1000	0	0	0	0	0

U

84.89	87.83	87.00	86.17	89.99	89.99
-------	-------	-------	-------	-------	-------

S - See 'J' above. These results represent year 1 of the new policy. It will be seen that the satisfaction level in this year is approximately the same as in the previous run, but that the collection bias is higher. The document exposure is also higher. The performance of this library illustrates that it is not possible to optimise all the measures of performance at the same time.

T - The cycle restarts. The library is identified by a "1". The player is satisfied with the performance produced by the loan policy already in use, and decides to retain it; "700" is input 6 times. However, he now wishes to buy 200 extra copies of books which were issued five or more times last year. He therefore inputs one "200" to represent the number of duplicates of books in this category which he wishes to purchase, followed by "0" five times for each of the remaining categories. He also wishes to purchase 1000 new titles, to be distributed, by the computer, across the six popularity classes. He therefore inputs "1000".

U - See 'I' above

RESULTS FOR LIBRARY I IN YEAR 2									
SAT. LEV.	COL. BIAS	DOCUMENT EXPOSURE	NO. OF ISSUES	AV. DOCEXP PER ISSUE	DUPS. BOUGHT	TITLES BOUGHT			
68.21	19.02	210688.9	26801	7.869	200	1000			
BOOKS HELD	TITLES HELD	YEAR'S COSTS	COSTS \$0 FAR	INC. IN SLT/1	INC. IN DEXP/1				
11200	11000	9880.1	11803.2	.0012	6.0289				
WHICH LIBRARY ARE YOU?							SIOP		

APPENDIX C

QUESTIONNAIRES TO BE USED TO
EVALUATE THE GAME

Questionnaire A should be administered to students both before and after they have used the game; Questionnaire B will be administered afterwards only.

UNIVERSITY OF LANCASTER - LIBRARY RESEARCH UNIT
LIBRARY MANAGEMENT GAME

QUESTIONNAIRE A

Please read all the questions before you begin your answers.
Do not confer with other players. You may spend as much
time as you wish.

This is not a test of your ability or intelligence, and
will be used solely to help us to evaluate our research.

- I. Imagine that you have been appointed librarian of a university or college library, and that your brief is to improve the service provided by the library as quickly as possible but without a large increase in budget. One of your first tasks will be to obtain information about the library. In the table below there are eight topics about which you may or may not require information. First put a "1" in the box provided opposite the topic which you consider to be most important, then put an "8" in the box opposite the topic which you consider to be least important. Now, ignoring the two topics which you have marked, put a "2" in the box opposite the most important of the remaining six topics. Put a "7" in the box opposite the least important of the remaining five. Put a "3" opposite the most important of the remaining four, a "6" opposite the least important of the remaining three, a "4" opposite the most important of the remaining two, and a "5" opposite the remaining topic.

	Rank
THE NUMBER OF RESERVATIONS (per week) -----	
THE LENGTH OF THE LOAN PERIOD(S) -----	
THE TOTAL NUMBER OF BOOKS IN THE LIBRARY -----	
THE NUMBER OF REGISTERED BORROWERS OF EACH TYPE ----- (e.g. students, staff)	
THE NUMBER OF BOOKS WHICH ARE USED A LARGE NUMBER OF TIMES PER ANNUM -----	
THE NUMBER OF ISSUES (per annum) -----	
THE UNIT COST OF EACH PROCESS (e.g. issuing a book) ---	
THE AGE OF THE COLLECTION -----	

On what other factors would you require information before you could improve the library service?

2. (a) What kind of relationship do you see between the total cost of a library's operations and the age of the collection?

- (b) What kind of relationship do you see between the total cost of a library's operations and the loan period(s)?

- (c) What kind of relationship do you see between the total cost of a library's operations and the existence of a reservation system?

- (d) If you examined the library's stock, what percentage of the books would you expect to find had not been used during the previous year?
Ring one of the following:

Less than 5% / 5-10% / 11-20% / 21-30% / 31-40% /
41-50% / 51-60% / 61-70% / 71-80% / 81-90% /
91-95% / More than 95%.

- (e) In your opinion, should the librarian try to increase the total number of issues per annum, and if so how?

- (f) Do you think that management techniques have any place in librarianship? Comment

- (g) How would you, as a librarian, assess whether or not a library service had been improved?

- (h) Do you think that, after finishing your course and qualifying as a librarian you could run a small library service efficiently? Comment

- (i) Do you think that librarians should have some training in the use of mathematical or statistical techniques? Comment

END

UNIVERSITY OF LANCASTER - LIBRARY RESEARCH UNIT
LIBRARY MANAGEMENT GAME

QUESTIONNAIRE B

Please read all the questions before you begin your answers.
Do not confer with other players. You may spend as much time as
you wish.

This is not a test of your ability or intelligence. It will
be used solely to help us to evaluate our research.

A rating-scale is attached to each question. Please put a tick
at the point on the scale which best describes your feelings.
You should regard the scale as a continuous line from, for
example, "good" to "bad", so that a tick at the point shown
below would indicate "fairly (but not very) good":

good —/—/—/—/—/—/—/— bad

and "very, but not exceedingly, bad" could be indicated by:

good —/—/—/—/—/—/—/— bad

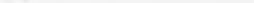
1. How does this course, using the Game, compare with other
courses you have taken at this School?

(a) more interesting —/—/—/—/—/—/—/— less interesting

- (b) If, in the future, you were given the choice, would
you prefer to take this kind of course (involving a
simulation-game) or a more traditional type (lectures,
seminars, etc.)?

prefer traditional —/—/—/—/—/—/—/— prefer gaming
course course

- (c) Do you think that you are more likely to be assessed fairly when you use the Game than when you use traditional methods?

Game Fairer  Traditional course fairer

- (d) Have you learnt more by using the Game than you have learnt by traditional methods?

Learnt less Learnt more

- (e) Do you think that the Game is realistic?

realistic —/—/—/—/—/—/— not realistic

2. Did you find that you worked harder during the Game than you would in a lecture or seminar? Yes/No Comment

3. Were there any aspects of the Game which we failed to make clear? Comment

4. Are there any suggestions which you would like to make for improving the Game? Comment

5. Which aspects of the Game did you find most rewarding? Comment

6. Which aspects of the Game did you find least rewarding?
Comment

7. Has the game given you an improved "feel" for the inter-
actions which take place within a library system?
Yes/No Comment

END

APPENDIX D

"The State-of-the-Art of Education for Library Management"

A Review

by

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1. WHAT IS LIBRARY MANAGEMENT?

Before reporting on the state-of-the-art of education for library management it is desirable to establish what is meant by 'library management'. It is very simple to include in this term descriptions of processes and procedures, but the work of the Library Research Unit at the University of Lancaster is more concerned with policy analysis, the basic relationships between the various resources of a library and the interaction between any or all of these resources.

There would appear to be three different concepts which can be incorporated within the term 'library management'.

- (a) Policy analysis: the allocation, division and relationship of resources.
- (b) Description of processes: the administrative and organisational systems, and technical processes.
- (c) Procedural efficiency: the investigation of methods and procedures to perform processes more efficiently and/or economically.

Undoubtedly all these concepts need investigation in an informed and scientific manner. In the educational process for librarianship, the coverage of (b), description of processes, and (c), procedural efficiency, is reasonably adequate. There is a great body of literature from which information may be gathered, and most of this information may be illustrated when students visit selected libraries.

So far as (a), policy analysis, is concerned, things are very different. The allocation of resources is made on the basis of decisions reached through hunch and politic devices, skills acquired through years of experience. The professional librarian is expected to acquire the ability to control his resources through the scope and depth of his experience. Patently this cannot be taught in schools.

Management research in other fields, to control industrial complexes, business organisations and so forth, has proved the need to know about, and to be able to manipulate appropriately, resources so as to produce efficiently and effectively whatever product is required.

It is at this level in librarianship that few librarians can scientifically assess what should be done, but professional managers could set up Operational Research studies and engage in systems analysis in order to reach policy decisions. The teaching side of librarianship has virtually no experience of the methods by which important policy decisions could be justified because it is drawn from the ranks of practising librarianship, which are equally devoid of such experience.

Therefore, the various syllabuses examined in compiling this report cannot include such things as OR as an aid in reaching policy decisions, except as a theoretical situation on a 'need to know' basis. If OR and systems analysis can illustrate what will happen in given situations based upon information gathered by other means, then the librarian has management information truly vital to his decisions.

'Library management' therefore, in the terms of this report, means the making of policy decisions on the allocation of resources - these resources include manpower, money, space, and stock, and link with the regulations by which the librarian controls the interaction of resources. The syllabuses referred to throughout this report include in 'library management' the administrative actions taken after reaching policy decisions, and the techniques and processes used to implement decisions.

It is, therefore, only these areas which can be reported upon as fact; but, of course, future needs can be construed, and commented upon as to their importance to the future of librarianship. Management information useful to the librarian may have to be gathered by a trained manager and its evaluation undertaken by consultation between the librarian and manager. At a lower level, an administrator may be concerned in evaluating processes and procedures, and because some of these processes and procedures are closely linked to a librarian's duties, he (the librarian) should be acquainted with them in some detail. This is very different from all student librarians being taught 'policy analysis', but it does not mean that they should not know about its existence.

Library administrative processes need to be known about at basic instruction level. Library management is of a more advanced nature where study must be based upon some experience and needs considerable motivation to apply it.

2. PRESENT COURSES IN LIBRARIANSHIP

The following courses are available to students of librarianship wishing to acquire their basic qualification, whether the Associateship of the Library Association or a degree in librarianship.

- (a) The Library Association - 2 year course.
- (b) The Library Association - post-graduate course.
- (c) The Library Association - mature entry scheme.
- (d) C.N.A.A. and University first-degree courses in both librarianship and information science.
- (e) University post-graduate courses in both librarianship and information science.

Each of these courses has a content of library administration, and a survey of these is necessary in order to understand the management education problems. All of these courses have to be approved by the Library Association in order to qualify the successful candidate for Associateship of that association; however there is an increasing tendency for those who qualify by routes (d) and (e) not to acquire the "paper" A.L.A.

2.1. L.A. 2 year course

The theme of administration continues throughout the six terms usual in this course; the first year provides a groundwork of general principles and methods which the student has to apply in the second year to the particular type of library selected for study in that year, e.g. public, special or academic and legal deposit libraries.

In the first year one of the four compulsory papers is concerned with library administration, and in the second year one of six. Most schools of librarianship devote up to three hours per week to this topic throughout the two years. Management topics are studied at an elementary level.

2.2. L.A. post-graduate course

One of the seven papers to be studied is concerned with library management; again about 3 hours per week is devoted to this subject over the three terms of this course, and only at an elementary level.

2.3. The mature entry scheme

The concept here is totally different, and since entrants must be experienced in the work of an information service, it may be assumed that they have considerably more experience in management and administration than those normally taking the two L.A. courses previously mentioned. Of the short courses of study which are a requirement for qualification under this scheme, it is probable that one will be on some management topic at a fairly advanced level.

2.4. C.N.A.A. degree courses

To examine this field is a little more difficult because of its relatively recent implementation. All the syllabuses examined show in their content considerable detail in the listing of management topics to be taught. It would appear that some of the techniques of management are to be taught, e.g. systems analysis, flow charting, critical path analysis, work measurement, etc., etc. Students will be instructed in

the objectives and work of Management Services Units and Organisation and Methods Teams. The various systems advocated for the implementation of management are noted, e.g. MBO, PPBS, and room is given for the inclusion of new techniques as they are developed. Use is to be made of teachers in the schools of management of the respective colleges and polytechnics.

The C.N.A.A. Courses are of three or four years' duration with management again threaded through these years, but sometimes only appearing for two of the years.

2.5. University courses

Here again the descriptions allotted to management teaching are more precise and modern than those of the Library Association, but management does not always appear as a subject to be taught throughout any course. Certainly at Sheffield and UCL some aspects of management are taught in depth (for instance, statistical methods), and the most advanced approach to the subject recorded in schools in this country takes place at such centres.

2.6. Short courses

Moving on from the acquisition of basic qualifications, the next career step upwards may rely upon the knowledge acquired by attendance at short courses. The value of these could be considerable because the motivation (promotion) to gain the knowledge provided in the course is much greater, and the student has probably decided upon the particular area of librarianship that best suits him, so that he is again studying with a stronger motivation.

Therefore, short courses concerned with library management attract committed people. The themes of these courses can be precise and confined to one topic; a suitable background will be assumed for those attending by those running the course. Experts can be engaged to expound upon particular aspects. More will be said about the value of short courses later, and a selection of titles will be given to illustrate the topics chosen.

3. RÔLE AND INFLUENCE OF EXAMINING BODIES

The syllabus content of any course is important in the depth and breadth to which any topic can be taught. Where, for instance, a superficial approach to management is all that a particular course contains, it is quite useless for a teacher to attempt to go more than fractionally deeper. The student is, or should be, aware of the area he is required to study and will have at least an inertial attitude to study beyond that area; at worst, a total resistance. Even given willingness to study further, the pressure of time needed to study the remaining topics will almost certainly preclude any reasonable attempt.

- 3.1. The intention of the C.N.A.A. as recently revised (1971) bears statement here:

"The Council considers ... that all courses leading to its degrees should, in addition to the specific aims of a particular course, attempt to satisfy the following limited general educational aims:

To develop in the student the ability to think logically, communicate clearly, and read critically and with understanding.

To make the student aware of the limitations of his disciplines and their methods and to provide opportunities for him to understand, make, and criticise, value judgments.

To give the student an understanding of the significance of science, technology, economics and sociological factors in modern society; of the contribution they can make to improve material conditions and in widening man's imaginative horizons and his understanding of the universe.

The Council believes that it is possible, in most courses, to bring out in the teaching the fact that scientific method, in the sense of a critical and sceptical approach to enquiry and a readiness to test hypotheses, enters at many points into subjects of the arts and social sciences..." (9).

Librarianship courses should, therefore, contain strong management content not only implicitly but explicitly, to enable librarians to evaluate the services which they provide and to study them critically.

- 3.2. The L.A. syllabus has remained mundane and uninspiring in its content, and is apparently caught between two attitudes - the desire to have a broad approach to librarianship, and uncertainty as to the length of time for which any course may be sustained. The two-year course could have greater management emphasis within the existing time-scale. It is not a hard course with much pressure upon a student's time. The syllabus content, in so far as library management is concerned, ranges from very specific annotations (e.g. A3 library law) to such wide annotations as to be useless (e.g. Paper 2, management, includes both principles and methods of library administration).

- 3.3. The post-graduate course presents a different set of problems. Three terms are quite inadequate to tackle seven subjects, especially when two compulsory subjects (G4 Practical classification and cataloguing, and G5 Subject bibliography) cause students to spend more time on them than on less explicit topics, such as G1 (The library in society) and G2 (The management of libraries). No matter that the student is academically trained and able to study, the time

available is quite inadequate in relation to the subject area to be covered. This course has the basis of good things, but needs a sharp overhaul. It would be inadvisable to lengthen the course, so the subject matter must be restricted.

As there seems to be a slightly stronger motivation towards librarianship as a career in the post-graduate as compared with the two-year course intake, it could be argued that full career prospects must rest more upon achieving an executive post in a library; therefore the management content of the course should be increased at the expense of some other subject.

It is worth noting here that the motivation for prospective librarians to acquire their qualifications by C.N.A.A. degrees cannot yet be assessed. From available information, C.N.A.A. librarianship courses tend to draw candidates from those who would otherwise take the L.A. 2 year course. Some schools claim that the C.N.A.A. courses cream off the best of the applicants who would have taken the latter, but this is not yet substantiated. The final choice lies with the candidate, and his decision could well be affected only by the desire, or otherwise, to gain 'a degree', rather than a degree in librarianship.

"At present the C.N.A.A. does not accept librarianship as a degree subject in its own right but this attitude might not be permanent. Present courses were too crowded and their acceptability to the profession untested"(7).

3.4. Both the L.A. and C.N.A.A. courses veer towards the vocational choice. The Universities offering courses in librarianship reflect the academic approach that one expects in all their courses of study. The theory of management is acceptable, but the application of such theories to library situations is sometimes lacking. Two university courses, however, do reflect the need for the contemporary librarian to be acquainted with at least some management techniques.

3.5. So, some syllabuses contain the appropriate words that could indicate a degree of management teaching. Broadly speaking, all the courses devote about the same amount of time to this topic, 2 to 3 hours per week. For adequate management teaching this is too little, and if those 2 to 3 hours are fragmented at all, the situation is worsened. It must be noted here that studying through the use of case histories, case-study methods, simulations and games requires a greater allocation of time than by 'chalk-and-talk' methods.

4. CAN ANYTHING BE DONE WITHIN THE GENERAL OUTLINES OF THE COURSES NOW EXTANT?

The L.A. course should terminate in examination papers of a more open type of question, requiring, not accounts of particular techniques or administrative methods, but thoughtful approaches to library management problems. To do this the number of questions to be answered in 3 hours must come down from 5 and 4 in 1st and 2nd year examinations respectively, to not more than 4 and 3 respectively. This would permit the entrant to think about a problem and write up his answer, rather than requiring him to put pen to paper and write for 30 to 40 minutes on a question, with little time to think. The present trend towards internal setting of questions and examining should be encouraged, because this can give teaching staff a degree of latitude in the emphases within courses which can be reflected in examinations. This latitude can do nothing but good to the profession. It commits a student to a choice of school for reasons other than geographical situation, and it enables schools to draw upon and develop any particular expertise available to them.

This is not the place to discuss the viability of other methods of 'examination', such as assessed course work, except to note that they exist and should be used where more appropriate; for instance, when simulations and games are used in teaching.

4.1. The C.N.A.A. requires schools applying for its approval to assess the capabilities of its staff as a whole and as individuals. It requires cross-fertilisation by using expert staff in other disciplines to contribute to the whole study in librarianship. College- and Polytechnic-based schools of librarianship may, therefore, use staff who have that most valuable combination of years of practical experience followed by teaching experience in disciplines other than librarianship. In any event, schools of librarianship situated in educational institutions with schools of management must make use of those staff teaching the latter discipline, providing that those staff orientate their message to explain the methods and techniques suitable for direct application to library management. Most management teaching is based upon a tangible, measurable end-product that can illustrate the benefits of good management by increased production. Libraries are thought not to lend themselves readily to such measurements and librarians tend to ignore demonstrably productive management techniques merely by saying - "it cannot be applied to libraries". The research being undertaken at Lancaster will, it is hoped, substantially disprove the implication that management techniques have no place in libraries.

4.2. A management approach to the whole question of library services could be undertaken. A library can be observed as a factory with a product to market, there are competitors to be surpassed in service to clients. The urgent need

is for libraries to be treated as dynamic rather than static institutions. Extensive consumer research is desirable and the librarian of the future should have some understanding of methods of consumer research and product marketing so that he can 'sell' to appropriate clients his library services.

5. WHO IS TAUGHT?

The intake in 1971-72 of new students seeking a first qualification in librarianship is as follows(27):

L.A. examinations		University or C.N.A.A.		
<u>P/G</u>	<u>Non-grad</u>	<u>Non-grad</u>	<u>P/G</u>	<u>1st degree</u>
223	664	12	357	268

Grand total: 1,524

5.1. The minimum requirement is two A-level passes, usually at or above grade D, for the L.A. 2 year course, and obviously higher qualifications for the remainder of the courses. It is unusual to find any student with science-based qualifications entering the profession. Between 12% and 16% of post-graduate students entering courses had a degree in a science-based discipline, but most of these are in life science, leaving about 3% or 4% with qualifications in the physical sciences. Most A-levels admitting for entry are in history and English literature, with a fairly good representation of French, less German, a little Spanish, very little Russian.

Approximately 5% of the A-level subjects achieved are in mathematics or allied areas, with one or two notable exceptions in courses offering a B.Sc. in librarianship or information studies. Here up to 40% have A-level mathematics, but the numbers of people involved are small, about 20 for each year's intake in those schools offering such studies.

5.2. It is possible in this respect to blame the profession itself because it has not decided what, if any, academic studies are appropriate in a student committing himself to a study of librarianship. The Library Education Group of the Library Association is currently giving some thought to this, as indeed has the present author for a number of years.

5.3. Certainly the bulk of the intake of students to schools of librarianship achieve nothing above an O-level pass in mathematics. This could be argued as having some degree of influence upon their choice of career, the implication being that librarianship is considered a career in which mathematical ability is not necessary. Research being

carried out by Professor G.F.M. Russell at the Royal Free Hospital, London, may stimulate investigation into whether or not most librarians are to some extent 'number-blind' (34). Should this prove to be the case, then the average librarian's attitude towards management can be explained, if not excused. This is not to say that to study management one must be a good mathematics student, but it would appear that a lack of ability in mathematics tends to go with a lack of understanding of and interest in management theory and practice, and precludes a sympathy with quantification, measurement and probability.

- 5.4. This is substantiated by questioning students about management. There is a definite lack of motivation to study it beyond an elementary level, but an examination of wastage in the profession could indicate a different or additional cause. About 75% of the profession leaves after 4½ to 5 years of service. Testing separate intakes at one school has shown that over 75% do not wish to reach positions of considerable responsibility; that is to say, a departmental head within a medium sized library service is the highest post they wish to have. These two proportions do not cover entirely the same people. Of the 25% who remain in the profession, some do not wish to reach positions which might be classified as managerial in content. Remarkably few students see themselves as future chief librarians. This may be because they shirk responsibility, and do not choose other careers because some degree of acceptance of responsibility is required early in those careers, (e.g. correct accounting for money, achieving productivity standards), whereas in librarianship, and teaching, there is as yet apparently no proof of failure or success; it is difficult to establish whether A or B is a good practising librarian, an indifferent one or a thoroughly bad one. At some later stage a few find their careers capable of being developed; a late motivation seems to take place, possibly encouraged by being in the right place at the right time.
- 5.5. 75% of the intake into librarianship is female. Over 80% of those occupying the top two posts, chief and deputy, are male; indeed by using some statistics this would appear to be a conservative estimate - it could be interpreted as upwards of 90%. Most special courses with a management content attract a high proportion of male candidates. Most management teaching in the schools of librarianship is done by men. (It is not possible to offer precise figures due to confusion as to what is management, or librarianship principles and so on).
- 5.6. Whatever may be the reason for the choice of librarianship as a career by the majority of entrants, it does not seem to be a desire to achieve senior positions.

5.7. If the profession is turning towards a graduate qualification, it does not appear on present facts that there will be other than a very slightly stronger motivation towards understanding and appreciating management. A slight improvement may be caused by the fact that the graduate, having spent longer in academic studies, is in greater need of quick success in his chosen career and should have the ability to study whatever topics appear necessary to achieve this end.

6. WHO TEACHES LIBRARY MANAGEMENT?

Most of the teachers in schools of librarianship are recruited from the ranks of practising librarians. Some teachers in specialist subjects are recruited from the teaching profession and a very few from the practising side of any other discipline.

6.1. A few, becoming concerned in the teaching of library management, have attended specialist courses on all or various aspects of management, and applied their knowledge thus gained to librarianship. Perhaps the most worrying aspect is that librarianship teaching does not attract many practising librarians; the competition for advertised teaching posts is small and the calibre of many of those appointed is not high. With the relatively small teaching force, it is perhaps understandable that no adequate special courses can be organised to instruct in teaching methods, although some schools do send staff to teaching colleges from time to time. The body of literature on teaching in librarianship is small. Many practising librarians, particularly older ones, still think either that any fool can teach the theory, and only failures at practice turn to teaching, or that it is unnecessary to have schools of librarianship for such a practical job, since it should be learnt by in-service instruction.

6.2. Teaching staff at most schools find their profession a safe haven which is not too demanding; they lack motivation to experiment, or to undertake research. This could be a sad reflection upon the uninspiring syllabuses of the various courses offered; it could also mean that motivation towards more inspired teaching is lacking because the teacher becomes depressed at the thought of some 75% of his effort being to no purpose, through the heavy wastage in the early years of ex-students' careers.

There are those staff with good intentions and a desire to inculcate in their students the critical faculties and judgment required of the good manager. The facilities offered by most of the institutions housing schools of librarianship are either inadequate or present difficulties of liaison, since they are often part of a different school. Staff/student ratios are often too poor to permit adequate attention being given to those students with more interest in library management.

Examples of what should be done are illustrated by the courses now offered at Sheffield and UCL, where aspects of management are being taught by experts in their subject and, indeed, a 'new look' is being given to library management.

- 6.3. Good teachers respond to the enthusiasm of a class by creating more enthusiasm. If a substantial majority of class members are merely interested in achieving a document which entitles them to a certain minimum salary, and soon places them on a reasonable grading for five years until they leave to get married, one can hardly blame teaching staff for lack of motivation.
- 6.4. The small number of schools must lead to little mobility in the teaching force, since all offer similar gradings and no other extra inducements are available. The geographical location of most of the schools is no added attraction, nor are the facilities and premises available much of an inducement to recruitment.
- 6.5. The practising librarians who have become teachers have been recruited from middle management level, and all too often have very limited experience even up to that stage so far as library management is concerned. This need not, however, be considered entirely a disadvantage, because the knowledge, the flair, may be in the teacher's equipment, and his management capability may have been far greater than his practical job required.
- 6.6. In the UK the opportunity for library school staff to undertake research on a scale adequate to enable them to develop an expertise is limited. The DES in its report on librarianship (14) restricted the development of all schools of librarianship because it estimated that enough librarians were being produced to meet the market requirements. This placed all schools of librarianship in the unenviable position of 'Cinderellas' when compared with other schools in their educational institutions. Effectively, expansion and development ceased except at one or two places. This in turn inhibited opportunities for research on any scale worth considering as a major contribution to library science, not because expansion and development in themselves facilitate research, but because in situations where the 'status quo' is being upheld it is difficult to persuade authority to provide time and space, let alone money, for anything more than normal routine activities. This would be less applicable in universities than in colleges and polytechnics because of the accepted place of research in the university activities; in future years it may be that all educational establishments will be encouraged to undertake some research.

If the Library Association has not funds to support research that can be done by its own Fellows, it is difficult to find financial support from other sources unless the Fellow has additional qualifications. In the case of management, very few teaching staff have management qualifications, and of these most are diplomas in public or municipal administration. Library management, no matter how knowledgeable any person is in this subject, is it not expertise that can be proved by any particular qualification. It is not yet accepted as a "speciality" or expertise that can be taught and assessed, except in one or two instances, such as Lancaster and Cambridge, where the two library research units exist.

It would help if it could be generally recognised that many Fellowships were won in years gone by, by those who today would have gone to university, if the places had been available, and achieved good passes. Some of these people teach today in schools of librarianship and are underrated in their knowledge and ability.

- 6.7. It is difficult to envisage any major development in the schools until the DES brake is released. There is no element of competition or specialisation involved at the moment; each school has enough applicants to fill its courses and in general has only sufficient time and staff available to continue with its routine affairs.
- 6.8. Some money for research is available, for example, from OSTI, but those concerned in research projects tend to jealously guard their work and to adopt a far too parochial attitude to it. Unfortunately, librarianship has always been like this. How many libraries are today experimenting with computer aid, yet without having access to each others' experiences? The schools of librarianship have the rather ineffectual Association of British Library Schools, which could so easily become a far more active and effective co-ordinating body in the teaching of librarianship.
- 6.9. The need appears to be for better recruitment and selection of staff for the schools, so as to attract teachers with initiative, enthusiasm and the desire to provoke in students a greater commitment to their chosen career. Some sort of teacher training course needs to be established so that those desirous of becoming teachers to the profession could gain experience and see if they have the aptitude to teach before they are appointed to teaching posts from which they cannot be discharged.
- 6.10. Another way to help enliven the situation would be for greater mobility in secondment each way (teachers back to practice, practitioners to teaching) for longish periods of perhaps two years.

There is something to be said for the arrangement found in many overseas schools of librarianship, which have a hard core of teaching staff supported by visiting lecturers drawn from librarians who practise within a reasonable distance of the school.

- 6.11. If library management can be shown to be a subject with some depth, requiring a particular expertise and interest, it would be beneficial to the profession to attract as teachers those trained in other suitable disciplines who are yet able to qualify their instruction with direct examples and applications in libraries. Very few people educated and trained in the various management processes have been inclined to try to apply these processes to libraries, or even to appreciate the need for a library to be subjected to investigation as a productive organisation. The various service industries are gradually being examined by managers with a view to measurement and the production of standards of achievement; perhaps the turn of libraries has now arrived.

A more effective approach however, could be one which has been proposed by the University of Lancaster Library Research Unit. This would be a scheme for the attachment of appropriate lecturers from schools of librarianship to the Library Research Unit for, perhaps, a term, during which they would be able to engage in an examination of management and libraries in the context of skilled advice and experiment.

The Unit is also, of course, researching the teaching of library management and the lecturers who could thus be involved would contribute to as well as gain from the work being done. The importance of such a scheme can hardly be over-stressed when a hard look is given to the whole area of current library management teaching.

7. WHAT IS TAUGHT?

This has been mentioned earlier and a short summary is all that is now needed.

- 7.1. In most courses that have been surveyed students are made aware of existing management terminology and definitions, and at an elementary level, of management techniques. Some courses pay greater attention than others to particular aspects of management, e.g. O and M, systems analysis, or personnel management. Because most of the courses investigated in this survey are concerned with basic librarianship, however, no aspect of management is taken very far, and this is understandable. Undoubtedly, more emphasis is being paid in drawing students' attention to, for instance, costing (not 'costs'), because of the pressures these days upon the practising librarian who has, quite rightly, to attempt to justify all expenditure.

7.2. A number of libraries, academic and public, have available to them the services - either full-time or part-time - of systems analysts. Consequently, the syllabus content of the various schools reflects this aspect of practising librarianship.

7.3. It would perhaps be better if students could be taught a far more comprehensive approach to management, so that the student of today, who will become the practising librarian of tomorrow might bring a critical, analytical mind to such library management as he becomes involved in. The stumbling block is the substantial wastage that occurs within the first five years of practice. If 75% of students on a course are not interested in achieving seniority in the profession, and, therefore, in accepting posts with considerable managerial content, it is inadvisable to teach knowledge to which they will shut their minds. This may be unfair on the remaining 25%, but the teacher will be in an untenable position if he tries to run two streams in one group.

8. HOW IS IT TAUGHT?

At the elementary level of most course content, the majority of the teaching is by lecture and example investigation. This latter is not case-study, or indeed case method, but a content-centred approach.

8.1. A substantial quotation from Thomas J. Galvin (16) is relevant here:

"There is no particular mystery about the case method, once its objectives are clearly understood. These can be stated in fairly simple terms. It is aimed, if you will forgive a bit of rhetorical license, squarely at the jugular vein of traditional library education. The objective of the case method experiments has been nothing less than the radical reformation of the library school curriculum, towards the end of bringing into existence a kind of professional education that is worth having.

Unless this is clearly understood, the whole point of the adoption of the case method will be missed. The use of case studies has not been, for us, merely an attempt to spruce up the standard curriculum. It is not a pedagogical gimmick to make the program of study more popular or more palatable. In education, ends must determine means. The reverse seems to me either irresponsible or intellectually dishonest. Those who have chosen to teach by the case method, or by some analogous problem-centred approach, have done so chiefly because the traditional content-centred curriculum seemed a less successful means of achieving a radically revised set of educational objectives.

I have used the qualifying adverb "chiefly" in the last sentence because the success of any teaching method depends ultimately upon the individual who employs it. The choice of a method must, then, it seems to me, remain a personal decision for each instructor to make on the bases of educational objectives and individual talents, abilities and tastes. No teacher ought ever be urged or compelled to use a method of instruction with which he feels uncomfortable, because to require this is to destroy the capacity to make a creative contribution in the class-room. For this reason, Simmons College has consistently rejected a syllabic approach to library education, and has left every instructor basically free to determine both the content and the method of his courses. Indeed, a major result of the development of the case method has been to broaden the range of choice for those who find more conventional patterns unsatisfactory or unsuitable".

- 8.2. Although many schools may be introducing a small degree of case-method learning, some rôle-playing, some simulation, there is as yet no body of teaching practice which legitimately can be called an original approach to librarianship instruction. With the greater freedom and independence of examination this may come, but it will be a slow process to move away from 'chalk and talk'. The practising librarian must become acquainted with management techniques first, otherwise he is unlikely to listen to a student recently out of library school propounding suitable management systems to apply in his library. Every situation, every idea, must first be related to the human situation in an organisation.

- 8.3. Abstract concepts are taught in the schools in cataloguing and classification - why not in management also?

The first concept to consider concerns the modern library with many needs to meet, and resources that are not fully exploited. Librarians need to be made aware that the effective exploitation of all resources is a major responsibility which can only be understood if they have a full appreciation of good management, i.e. that the librarian is someone responsible for providing a library service, and that to carry out this responsibility various skills are needed - cataloguing, bibliographic knowledge, management knowledge.

A library does not organise and run itself. The librarian must appreciate that it is part of his job to organise and administer the service; to measure output; to appraise systems, methods and procedures critically; to control staff and their work-loads; in fact, to direct the library services. This must be just as much a part of the job as assistance to readers, cataloguing and classification.

Because the measurement of library activities has not been possible until recently this is not to say that measurement is not needed. The pressures upon the availability of all resources in any library are greater than ever before. Perhaps the librarian of the past 'had it too easy', and was inefficient in not fully exploiting his resources.

There is no doubt now that he must be fully conversant with the management of his organisation, and, as aides, there may be the need for experts in systems analysis, operational research, personnel management, to whom the librarian may turn for advice, while realising that the decisions lie in his hands alone.

- 8.4. To return to how library management is taught, advances are being made both in this country and the USA. Role-playing schemes are being developed at, for example, Florida State University, School of Library Science, as reflected in the work of Dr. Martha Jane K. Zachert (43).

The author of this report is experimenting with various ideas, but as in all teaching, experimentation must be careful and slow for fear that trying out a new idea may fail as a teaching aid and inhibit, if not worse, the students upon whom it was inflicted. As has been stated already, syllabus limitations are also a grave restraint.

- 8.5. Other methods of teaching are commonplace but none-the-less useful; tours and attachment to a library during a two or three year course are examples. A student may see in action what has been described in class. The world of theory and the world of practice are drawn closer together to the advantage of both. Attachments can provide valuable experience where little existed prior to attending a school, and can provide a change of environment to a fairly experienced student if he is sent to a type of library different from that which he knows. What is gained from such attachments depends almost totally upon the host library. In present circumstances it is quite impossible to conceive that about 1500 students could undertake attachments each year, which would be the case if every student had to be attached to a library for part of his course. The benefits of attachment are limited; it cannot become a microcosm of the whole course; it relies very heavily on the enthusiasm and commitments of the host libraries, and indeed upon individual staff within those libraries, not just on the expressed policy of authority. There is interference with teaching programmes, and considerable administrative work in its implementation. A partial answer would, of course, be 'teaching libraries' on the lines of the 'teaching hospitals'.

9. COMPARISON WITH SOME OTHER COUNTRIES

Every library school catalogue from the USA includes a proportion of 'library management' instruction and it would seem that the content of these courses compares favourably with management instruction in business courses. It would appear also that because the student of librarianship in the USA is some 5 to 7 years older than in the UK, there is a better appreciation of the necessity to learn about management techniques. Certain individual efforts, (such as Dr. Zachert at Florida State University, School of Library Science, has prepared) present simulation studies that are available to students as a 'package' to illustrate specific problems of, say, personnel management, or planning.

9.1. In Europe, so far as can be ascertained, the course content is traditional, perhaps even conservative. The senior librarian gains management knowledge through practice and experience and some aid from short courses. Syllabuses from schools in developing or recently established countries again show a traditional approach, very concerned with common 'house-keeping' techniques for the library.

9.2. The conclusion may be drawn that only in the USA and UK is any real attempt being made to discover what management education the librarian really wants, and how to teach the acquisition of such an education.

10. CONCLUSIONS

From the preceding survey certain inferences may be drawn. Any course in librarianship must aim to teach the student the skills necessary to become a good librarian. It is possible that no course examined in the UK gives enough attention to stock selection and maintenance as items with which a librarian must be well acquainted. It can be argued that all student librarians should be required to study in depth one subject field. If we add cataloguing, classification, information retrieval, search techniques and the library and the community, a full syllabus is acquired. But the librarian is not only going to need to know about these things, he will also need to know how to exploit them effectively.

10.1. If it is true that the majority of students are not motivated towards management, then one answer is to provide librarians with manager-aides. These could be staff suitably trained in management, but not necessarily in librarianship, and given a gloss concerning the problems of library management when they enter that field, or consider entering it. To some extent this is now happening: several libraries have systems analysts and personnel managers on their staffs. Particularly in the local

government area, amalgamation and changes of boundaries are producing quite large library units and it is conceivable that the management services inherent in the library service needs of these organisations should be provided by management-trained personnel.

However, these aides could only provide the librarian with advice and specific information relevant to their own expertise. If management is concerned with policy, only the librarian can correlate and assess the implications of particular advice or comment. For this, management ability is needed, something which at the moment is not taught in any course in sufficient depth to permit the student to become a manager, but merely to become an administrator, who implements procedures and systems decided upon by somebody else. One important aspect of management is leadership, others are direction and planning. It is not enough to know about systems and methods, the library manager has to implement the whole process of management to make the library operate as nearly as possible at its optimum level of effectiveness.

10.2. There would still be scope and the necessity for short courses in particular management topics, both for those librarians interested, and for other staff whose functions demand such knowledge .

10.3. Simulations and games, which demonstrate the interplay of the resources of libraries and the techniques of librarianship, must surely be most valuable in educating the experienced, committed librarian. He will understand the implications of the problems being posed and he will be able to evaluate, to some extent at least, the process and progress of the game and its results. The game, therefore, becomes to him a viable method of learning more about library management.

10.4. The most important contribution must, therefore, lie in integrating into librarianship teaching aids which may be used in training library managers in decision making, in judgment, and in encouraging them to discover and use the information necessary to create more effective libraries with the resources available to them.

10.5. A 'short' course for this purpose might be of one week to three weeks' duration, depending upon the course content. There must also be considered the desirability of longer courses, or of short secondment, where the candidate could achieve fuller expertise by, for instance, being committed to carry out exercises or simulations in laboratory conditions to exhaust the implications of compiling management information. These longer courses would be aimed at educating the manager to a very high level of ability.

Through such education and experience the profession could build up a pool of expertise which would be valuable and available to all librarians. This need not preclude the development and incorporation of suitable games into first level courses for teaching purposes.

- 10.6. The future of library management studies lies in the provision of short courses on specific topics aimed at educating the librarian of some experience who has the motivation to progress in his chosen career. What now need investigating are the areas of management study which it is desirable to teach, the level at which they should be taught, and the length of time for which most libraries will willingly send suitable staff. There are other administrative matters needing attention; a fair allocation of courses on a geographical basis so that staff can be encouraged to attend on a non-residential basis as well as residential; an annual programme of courses co-ordinated by some body or other, (possibly the Library Association, or ABLIS) so that all aspects of management are covered to the extent to which the market requires, and unnecessary duplication is avoided.
- 10.7. There will be some benefit to the schools presenting such courses. The teaching staff of each school at which courses were based would reap the benefit of visits by appropriate experts, their knowledge of management activities would be brought up-to-date, and perhaps more research would be generated.
- 10.8. An alternative or additional answer could be the establishment of a "School of Library Management", where courses could be directed toward a full understanding of management principles, decision-making, systems, techniques, and the use of whatever aids in teaching best lend themselves to such instruction. The school could award an appropriate qualification; the candidates accepted would be strongly motivated towards their subject. Such a school would also be a research centre in library management, to the advantage of both teaching staff and students.

11. COMMUNICATION

It is necessary that the professional bodies make themselves fully conversant with the aims and facilities of the Library Research Units. These units must not work in a vacuum, nor must they be considered to be researching in 'way out' ideas.

The profession is suspicious of an examination of its long-established tenets, but this should not be permitted to hold back research. What is needed is consultation and communication in a common language. If the bulk of the profession cannot

comprehend the ideas propounded by Morse (29), or the various University of Lancaster papers (e.g. (5)), by appreciation and application, and the profession will still work with poor management knowledge.

The ideas of satisfaction level, document usage and collection bias must be simply explained; the benefits inherent in the knowledge which new techniques bring must be capable of being understood by the 'ordinary' librarian, or else he will always be 'frightened' by them.

This places a heavy responsibility upon the research units to communicate in the language of everyday librarianship at first, until the whole profession is newly educated, and appreciative. Their first contact must be through interested people wishing to learn to comprehend, and these people should be the raw material for the first set of demonstrations of any suitable games designed to implement the effect of this knowledge of new factors.

Finally, although perhaps the new techniques may be more easily applied to university libraries, or other establishments with a captive readership, the research units must appreciate that library management information must have a common theory applicable to all types of libraries. All kinds of librarians must be attracted to study new methods, to help provide solutions to the more difficult situations inherent in the different types of library services.

APPENDIX E.

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